

Learning from Past Societies

The sustainability lessons are there, if only we can find them

Recent books like *Treading Lightly*, by Sveiby and Skuthorpe, 2006, and *Collapse*, by Jared Diamond, 2005, have made serious efforts to learn sustainability lessons from past societies, notably the Australian Aborigines and Easter Island Polynesians. The premise is that there is much to learn from the few successes of past societies that were sustainable, and from the many failures of those that were not.

This paper argues that the premise is sound, but the approach used in executing the premise in these works is not. The approach lacks the full analytical rigor necessary to extract valuable cause and effect insights that are highly applicable to today's sustainability problem. This paper explores this proposition by assessing the process maturity used in the two books. It concludes that while both books have taken valuable first steps, the chief value of works like these lies in the accumulation of data that can be used in future analyses, ones that are more analytical than intuitive.

The Premise

Two remarkable books examining past societies for lessons on how today's society can live sustainably have appeared in the last two years. These books share a common premise: Very few past societies were sustainable. The rest were not and ultimately collapsed. *Why did some succeed and others fail?* If we can find the answers to that question, we should be able to apply it to today's sustainability problem.

This is the premise of *Treading Lightly: The Hidden Wisdom of the World's Oldest People*, by Karl-Erik Sveiby and Tex Skuthorpe, published in 2006. The introduction "states the topic of this book," which is: (Italics are in the original)

"Australian Aboriginal society's model for sustainability has the longest proven track record on earth. [40,000 years] While

societies outside Australia emerged, prospered and went under, Aboriginal society withstood and proved its sustainability over tens of thousands of years of dramatic events, until the Europeans' arrival in 1788. It is an extraordinary achievement, especially considering that this is something humanity is now struggling with: the way to build a truly sustainable society on this earth.

"How did the Aborigines do it? How did they organize for sustainability? What type of leadership did it require? They must have had a 'recipe for success.' What was it? Could we reconstruct it?"

The back cover offers this premise:

"Aboriginal people taught themselves thousands of years ago how to live sustainably

in Australia's fragile landscape. A Scandinavian knowledge management professor meets an Aboriginal cultural custodian and dares to ask the simple but vital question: What can we learn from the traditional Aboriginal lifestyle to create a sustainable society in modern Australia?"

The other book we shall examine is *Collapse: How Societies Choose to Fail or Succeed*, by Jared Diamond, 2005. This book, a strong best seller, has set the new standard in this area. It probes the question:

"What caused some of the great civilizations of the past to collapse into ruin, and what can we learn from their fate?"

A Note about Our Conclusions

This is not your normal book review. It is an educational analysis, based on an objective assessment of the process maturity each of the books used to achieve its stated goals. If you want to agree or disagree with the conclusions of the analysis, then you need to understand the foundation of the argument. It is here you should apply your logical criticism, rather than the conclusions of this paper.

The analysis is based on two key assumptions. These are:

1. The more difficult the problem, the more mature the process used to solve it must be.
2. Process maturity can be objectively measured by breaking the process down into the key factors that make the difference.

Applying these assumptions, this paper arrives at three main conclusions:

1. Neither book gets to the bottom of why societies fail or don't fail to live sustainably.
2. Thus they do not contain anything significant that can be applied to today's sustainability problem.
3. The failure to find out why is caused by problem solving process immaturity.

Many readers may be upset with these conclusions. They may really like the descriptions of culture, the data about the behavior, and the sensitive, in-depth way this is handled. I agree that both books provide excellent general anthropological coverage. They are also very educational and even inspirational about what the environmental sustainability problem is and why we must solve it. These areas are not what this paper is examining, however.

Now let's turn to the task at hand. *We start with the premise that the top goal of both books is to explain why some societies failed and others succeeded in solving their own environmental sustainability problems.*

An Assessment of the Process Maturity of the Two Books

The premise is sound. It is even commendable, because if we can find the answers to the questions posed, that should go a long way to helping us solve the sustainability problem. But the premises are not fulfilled. The reason is neither book follows a process mature enough to achieve its mission. They have violated the principle that:

The more difficult the problem, the more mature the process used to solve it must be.

This principle and its ramifications are taken up at length in the manuscript to *Analytical Activism*, online at Thwink.org. The chapter on *An Assessment of Problem Difficulty* presents the argument that the sustainability problem is highly difficult, rates the factors causing that to be so, and concludes that only a process mature enough to handle these factors will be able to solve the problem. The next chapter, *An Assessment of Process Maturity*, builds on this with an assessment of several dozen environmental organizations and books, using 11 key process elements.

This paper uses the 11 process elements to assess why *Treading Lightly* and *Collapse* both failed to achieve their missions. For more on the process elements please see the above chapters and the rest of the book. As you read this paper, you will notice that

the process elements apply equally well to organizations, which is where their real value lies.

We will now perform an assessment of the process maturity of the two books. As we do so, there are two important strategic lessons to be learned:

Lesson 1: A True Analysis Is Required on Difficult Problems

Most people don't care about analysis. They just want to know about the solution, or move as quickly as possible from whatever goals they have to a solution. They are intuitive and use common sense, which works well on everyday problems. They are allergic to deep analysis, and reject the idea that in a very difficult problem you need to spend 80% of your time in analysis, and not data collection or trying solution after solution to see if it works.

Most people don't know what analysis is. **Analytical** means the use of analysis to solve problems. **Analysis** is breaking a problem down into smaller problems so they can be solved individually. For a difficult problem, this has the effect of taking a giant Gordian knot of incomprehensible complexity and deftly turning it into a collection of much simpler and therefore potentially solvable problems. In practice this decomposition is so powerful it can transform a problem from insolvable to solvable.

When we say *a true analysis of the problem is performed*, we mean:

- 1. Structure** – A structured examination of the system with the problem has been performed.
- 2. Diagnosis** – The fundamental flaws causing the problem symptoms have been found. The patient has been diagnosed.
- 3. Resolution space exhaustion** – An exhaustive examination of the full range of solution alternatives to resolve those flaws has been conducted.

If any of these three steps has been omitted or done poorly, a true analysis has not been performed. This, as you can probably already tell, is the case for both books.

However, *Treading Lightly* and *Collapse* do not have to perform a full true analysis to make a contri-

bution. They can do just steps 1 and 2, because that is all it would take to achieve their objectives.

Treading Lightly does not perform anything close to steps 1 and 2. Instead, what it offers is a large collection of data that can be used as the starting point for a true analysis. *Collapse* does much better.

Lesson 2: The Process Must Fit the Problem

Would you try to travel through Europe with a map of Africa? Would you try to dig a well with a spoon? Would you try to bake a loaf of bread with a recipe for cottage cheese? Or would you even dream of designing the Eiffel Tower using only the rules for building a sand castle on the beach?

Of course not, because the tool or the process does not fit the problem. But that doesn't matter to the millions of problem solvers who have been working on the sustainability problem for decades, with a smorgasbord of processes, nearly none of which fit the problem.

As we move through the 11 key process elements, you will begin to see what *the process must fit the problem* means. If it doesn't fit, all the brilliance and brawn in the world will make, and has made, very little difference.

The Process Maturity Assessment Table

On the next page is the process maturity assessment table for the two books. The process elements are weighted, so that we can emphasize which are more important to fit the problem. The weights vary from 1 to 4. The greater the effect an element has on productivity, the higher the weight.

Each score has two parts: raw and weighted. Raw scores for each process element are assigned this way:

- 0 - Does not exist, not done
- 1 - Very low productivity
- 2 - Slightly productive
- 3 - Moderately productive
- 4 - Highly productive
- 5 - World class

If an element is not applicable, it automatically receives a score of zero, denoted by 0n. The adjustment = (total score / (100 – sum of zero scores at five times their weights)) * 100.

Process Maturity Assessment					
Process Element	Wt	Treading Lightly		Collapse	
		Raw	Wtd	Raw	Wtd
Classic Activism Steps 1, 2, 3, and 4					
1. Identify the problem	1	5	5	5	5
2. Find the proper practices	1	5	5	5	5
3. Tell the people the truth about the problem and the proper practices	1	4	4	5	5
4. If that fails, exhort and inspire the people to support the proper practices	0	4	0	1	0
Analytical Activism Key Best Practices					
5. Formal definition, management, and continuous improvement of a process that fits the problem	4	0	0	2	8
6. A true analysis of the problem is performed	3	0	0	4	12
7. The Scientific Method is used to prove all key assumptions	3	1	3	4	12
8. Learning from past failures and successes is maximized	2	0n	0	0n	0
Problem Domain Key Best Practices					
9. The analysis centers around a social system structural analysis	2	1	2	2	4
10. Low and high leverage points have been identified and tested.	2	0	0	0	0
11. Why change resistance is so successful has been determined. (Diagnosis of root cause)	2	0n	0	1	2
Total score on scale of 0 to 100			19		53
Adjusted score for automatic zeros			24		59
Process Maturity Rating = Adj. score squared, on a scale of 0 to 10,000			576		3,481
Mission success			Low		Med

Process Element 1: Identify the Problem

Both books identify the problem they seek to solve well. This is to find the reasons why one or more societies succeeded in living sustainably, and how that can be applied to today's society. Both receive a perfect 5 here.

Process Element 2: Find the proper practices

All problems have symptoms. All symptoms have a cause. In activist problems the *immediate* cause is always that people are not following the proper practices. Their behavior needs to change, by getting people to adopt the proper practices. Examples of proper practices for the sustainability problem are using

renewable energy instead of fossil fuels, and the three Rs of reduce, reuse, and recycle.

The proper practices for how past societies could have lived sustainably are, in retrospect, obvious and easily described. At the high level they are the same ones we should follow today. Both books score another perfect 5 on this process element.

Process Element 3: Tell the people the truth about the problem and the proper practices

Both books mix in the educational message that we must all live sustainably if we are to avoid collapse. Numerous examples are given of what happens if we live unsustainably. What environmental sustainability consists of is described and implied throughout both books. Even though most readers already know the truth about the problem and what the proper practices for living sustainably are at the high level, this is a message worth repeating, because it displaces other messages to the contrary and strengthens belief in sustainability through repetition.

Treading Lightly scores only a 4 here for highly productive. It is not as complete as *Collapse* in describing the many details of why and how cultures impact their environment. Nor does it go into any of the detail *Collapse* does on proper practices, such as there are "three alternative arrangements that have evolved to preserve a commons resource while still permitting a sustainable harvest."

Here is a typical passage from *Treading Lightly*, page 189, about the proper practices:

"We in the Western world live in a 'Great Illusion,' not in reality. We behave as if the ecosystem comes free of charge and we also run our economies and allow our politicians and company leaders to live the illusion. A part of the problem is that our systems to measure wealth mislead us. We have elaborate systems for measuring the financial wealth created, but we have no idea about the simultaneous wealth destruction in natural capital."

Collapse has clearly achieved world class performance on this element, judging by its best seller status. For greater eloquence and intellectual content, it receives a 5. For example, examine the depth of

detail and insight in the following passage from page 495. This describes how the most popular solution strategy in the world today, sustainable development, is a cruel promise that will not work. It is the wrong proper practice.

“People in the Third World aspire to First World living standards. They develop that aspiration through watching television, seeing advertisements for First World consumer products sold in their countries, and observing First World visitors to their countries. Even in the most remote villages and refugee camps today, people know about the outside world. Third World citizens are encouraged in that aspiration by First World and United Nations development agencies, which hold out to them the prospect of achieving their dream if they will only adopt the right policies, like balancing their national budgets, investing in education and infrastructure, and so on.

“But no one at the U. N. or in First World governments is willing to acknowledge the dream’s impossibility: the unsustainability of a world in which the Third World’s large population were to reach and maintain current First World living standards. It is impossible for the First World to resolve that dilemma by blocking the Third World’s efforts to catch up: South Korea, Malaysia, Singapore, Hong Kong, Taiwan, and Mauritius have already succeeded or are close to success; China and India are progressing rapidly by their own efforts; and the 15 rich Western European countries making up the European Union have just extended Union membership to 10 poorer countries of Eastern Europe, in effect thereby pledging to help those 10 countries catch up.

“Even if the human population of the Third World did not exist, it would be impossible for the First World alone to maintain its present course, because it is not in a steady state but is depleting its own resources as well as those imported from the Third World. At present, it is untenable politically for First World leaders to propose to their own citizens

that they lower their living standards, as measured by lower resource consumption and waste production rates. What will happen when it finally dawns on all those people in the Third World that current First World standards are unreachable for them, and that the First World refuses to abandon those standards for itself?”

Process Element 4: If that fails, exhort and inspire the people to support the proper practices

Treading Lightly does a great job with exhortation and inspiration, with passages like this one from page 199: (Italics added on the exhortation)

“Today’s leaders *should be* driven not by their personal ego-driven question for personal power, but by a genuine motivation to serve their people. The *must* respect all their people, in particular the less knowledgeable and the less fortunate. The *must* be considerate and ask for advice before they act; they *must not* conceal their true purpose and they *have to* review the effect of their actions.”

Treading Lightly relies mostly on Aboriginal stores for inspiration.

Inspiration is superior to exhortation. This is the mechanism *Collapse* relies on to reach the reader deeply, as this passage on page 521 illustrates:

“If Easter Islanders couldn’t solve their milder local problems in the past, how can the modern world hope to solve its big global problems?”

“People who get depressed at such thoughts often then ask me, ‘Jared, are you optimistic or pessimistic about the world’s future?’ I answer, ‘I’m a cautious optimist.’ By that I mean that on one hand, I acknowledge the seriousness of the problem facing us. If we don’t make a determined effort to solve them, and if we don’t succeed at that effort, the world as a whole within the next few decades will face a declining standard of living, or perhaps something worse. That’s the reason I decided to devote most of my career efforts at

this stage of my life to convincing people that our problem have to be taken seriously and won't go away otherwise.”

However, *Collapse* uses very little exhortation and inspiration. Instead, it relies on logical argument. Thus it scores only a 1 for low productivity, while *Treading Lightly* scores a 4 for highly productive. The bulk of *Treading Lightly* is inspirational Aboriginal stories, combined with a heavy dose of inspirational mysticism and belief in the supernatural that keeps popping up throughout the book.

These scores don't matter at all, however, because this process element has a weight of zero. Why is this?

The reason is that exhortation and inspiration work fine on easy problems, moderately well on medium difficulty problems, and not at all on difficult problems such as climate change. This is because on difficult problems, this process element is pushing on the attractive low leverage point of “more of the truth.” Pushing there will not work on difficult problems because these exhibit high system change resistance. The system pushes back just as hard. For more on this subject, please see the paper on *The Dueling Loops of the Political Powerplace*.

The Four Steps of Classic Activism

We have just rated the books on the four main steps of **Classic Activism**. This is the method used by over 95% of all environmental organizations today, including those in grassroots organizations, academia, business, government, and the United Nations.

While Classic Activism works fine on easy problems, it fails on more difficult problems like climate change *because the problem solving process does not fit the problem*. This is *the* strategic reason why the environmental movement has failed to make any significant progress in solving the global environmental sustainability problem in the last 30 years.

The reasons Classic Activism does not fit the sustainability problem will become apparent in the remaining process elements. *Treading Lightly* scores low in the remaining elements. This means that however well written it may be, it is essentially relying on Classic Activism to achieve its goals. By contrast, *Collapse* scores well in most of the remaining elements by taking a more analytical approach, which caused it

to deliver a better product, which in turn caused it to be so well received by its readers.

The Four Best Practices of Analytical Activism

The alternative to Classic Activism is Analytical Activism. **Analytical Activism** is the use of true analysis to find how to change the system, rather than continuing to treat the symptoms, so that the system's new equilibrium solves the problem. A more formal definition is Analytical Activism is the use of the Analytical Method to achieve activist objectives.

For example, electing "better" politicians or passing regulations to control certain types of unsustainable behavior in an increasingly complicated and contentious piecemeal fashion has not worked. These efforts only treat the symptoms, and fail to strike at the root. The real questions are: Why does the system attract mostly incompetent and corrupt politicians? Why does the system resist change so strongly? What are the fundamental reasons the sustainability problem is so difficult to solve?

There is more to practicing the process of Analytical Activism that the nine steps shown could possibly describe. Analytical Activism, like all powerful tools, must be accompanied by certain strategies or its full power will not be realized. It is these strategies, rather than the steps in the process, that form the four best practices of Analytical Activism.

The four key best practices of Analytical Activism are, from my experience, always present in analytical approaches to extremely difficult problems that succeed. According to Wikipedia, "A **best practice** generally refers to the best possible way of doing something; it is commonly used in the fields of business management, software engineering, and medicine, and increasingly in government."¹

Let's rate the book on the four best practices of Analytical Activism:

Process Element 5: Formal definition, management, and continuous improvement of a process that fits the problem

A **process** is a repeatable series of steps for achieving a goal. For example, doctors have a standard procedure for diagnosing many types of illnesses, starting with the symptoms. Other examples of processes are a constitution, Robert's Rules of Order, the method of long division, and the Scientific Method. All are a much better and more predictable way of achieving a goal than no process or the wrong process.

If the process fits the problem, then if correctly followed and continuously improved it will lead to solution or to discovery the problem is insolvable. No other process element can make this claim. *Therefore the most important element in the entire process maturity table is the use of process itself.* It must be formally defined, formally managed, and continuously improved. Because it is the most powerful process element of them all, it receives

a weight of 4. This defines the upper end of the *reference range* of the weights used in the table, which range from 1 to 4.

Let's see how the books did on the most important process element of them all.

On page xix *Treading Lightly* describes the process it will use:

"The approach in this book is an attempt to 'make sense' of traditional Aboriginal knowledge from an organization and society perspective.

"The analysis is primarily based on qualitative data and the main sources come from oral tradition. For this reason, reliability and validity merit special attention. The methodological approach is to combine the Nhungabarra stories with as many different sources as possible: written sources, site visits and interviews. Whenever possible, at least three

The Analytical Method

1. Identify the problem to solve.
2. Choose an appropriate process.
3. Use the process to hypothesize analysis or solution elements.
4. Design an experiment(s) to test the hypothesis.
5. Perform the experiment(s).
6. Accept, reject, or modify the hypothesis.
7. Repeat steps 3, 4, 5, and 6 until the hypothesis is accepted.
8. Implement the solution.
9. Continuously improve the process as opportunities arise.

sources have been combined: a story, a written source and a visit to the site in the story. This is a validation method familiar to qualitative researchers and is known as triangulation.”

This describes the process of collection of data. It does not touch on how the data will be used to answer the question “What can we learn from the traditional Aboriginal lifestyle to create a sustainable society in modern Australia?” That is the principle problem the book is trying to solve, not collection of data, which is a mere preliminary to analysis of the data. Therefore *Treading Lightly* scores a zero here, because the process element does not even exist.

Collapse fares much better. On page 17, Diamond devotes two and a half pages to the question of “How can one study the collapse of societies ‘scientifically?’” His answer is:

“This book employs the comparative method to understand societal collapses to which environmental problems contribute. My previous book (*Guns, Germs, and Steel: The Fates of Human Societies*) had applied the comparative method to the opposite problem: the differing rates of buildup of human societies on different continents over the last 13,000 years. In the present book focusing instead on collapses rather than on buildups, I compare many past and present societies that differed with respect to environmental fragility, relations with neighbors, political institutions, and other ‘input’ variables postulated to influence a society’s stability. The ‘output’ variables that I examine are collapse or survival, and form of the collapse if a collapse does occur. By relating output variables to input variables, I aim to tease out the influence of possible input variables on collapses.

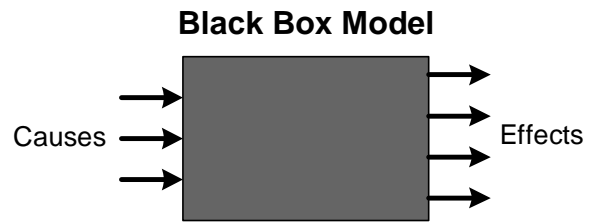
“Only from the weight of evidence provided by a comparative study of many societies with different conditions can one hope to reach convincing conclusions.”

Diamond has outlined his process thoroughly. But does it fit the problem?

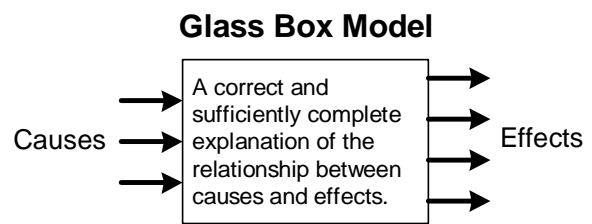
No. This may come as a shock, but the comparative method is insufficient for solving complex social

system problems. This is because such problems require a glass box model rather than a black box model, if you are to find out *why* the inputs cause the outputs, and deeply and correctly answer questions like the title of his chapter 14: “*Why Do Some Societies Make Disastrous Decisions?*” Black box models cannot say *why* any input causes an output, only that it does.

As shown below, a **black box model** of a system knows only the relationship between inputs and outputs. For example, society has long known that you must eat to survive. But until modern anatomy and biology explained that food provided the nutrients and energy needed by the body and how these processes worked, no one knew *why* we had to eat to survive. Or they had theories that were wrong.



What modern anatomy and biology provided was a **glass box model**, which is a model allowing you to clearly and correctly see *why* cause and effect occur. For example, after Newton discovered gravity and the mathematical laws governing the movement of bodies, astronomers had a glass box model of the universe. They could now accurately predict where heavenly bodies would be in the future (the effect) given their present location, speed, and other bodies whose presence affected them (the cause). As shown below, a glass box model provides a correct and sufficiently complete explanation of the relationship between causes and effects.



Without a glass box model of why some societies collapsed and others did not, we will be unable to

glean the insights necessary to transfer that knowledge to today's sustainability problem.

But at least Diamond has a process that will allow construction of a sound black box model. Correlations can be useful, especially compared to nothing on cause and effect at all. For this reason *Collapse* scores a 2 for slightly productive.

Process Element 6: A true analysis of the problem is performed

Earlier we emphasized that the essential elements of a true analysis are:

- 1. Structure** – A structured examination of the system with the problem has been performed.
- 2. Diagnosis** – The fundamental flaws causing the problem symptoms have been found. The patient has been diagnosed.
- 3. Resolution space exhaustion** – An exhaustive examination of the full range of solution alternatives to resolve those flaws has been conducted.

If any of these three steps has been omitted or done poorly, a true analysis has not been performed. Let's start with step 1. Because this is a difficult complex social system problem, a structured examination will require system dynamics.

System dynamics is an approach to modeling systems that emphasizes their feedback loops, using stocks, auxiliary variables, and flows of influence. Invented by Professor Jay Forrester of MIT in the early 1960s, system dynamics uses a standard visual notation and an interrelated collection of mathematical equations to mimic a system's important structure, with the goal of gaining new insights into how and why the system works the way it does. A computer program then runs the equations, which simulates the behavior of the system. The chief output is in the form of graphs over time, which show the dynamic behavior of the system under the assumptions used for each particular simulation run.

Most sustainability problem solvers do not use system dynamics as a principle tool. This is puzzling, because this was the tool that so persuasively identified the problem in 1972. That was the year that *Lim-*

its to Growth was published. It went on to become the best selling environmental book of all time, at 30 million plus copies and counting, compared to about 10 million for *Silent Spring*. *Limits to Growth* stunned the world with discovery *and proof of existence* of a new top priority problem, one the world had been almost completely unaware of before.

The book's central argument was buttressed on a simulation model called World3. The model simulated the behavior of the main parts of the human system that were causing that system to bump up against its environmental limits. The model allowed an argument to be presented that was deep, correct, communicable without ambiguity, and irrefutable, which is why the book was so influential.

The book's central argument was that the earth's environmental limits were soon to be reached, and that once the human system was in overshoot, environmental and economic collapse was unavoidable. This conclusion has become globally accepted, and lies at the very core of why civilization needs to proactively solve the environmental sustainability problem. The scientific world now believes there are "limits to growth," a phrase the book introduced. This limitation to business as usual has not yet been fully accepted by most of the business world and many governments.

A minor argument that turned out to be false has been used by some critics of the book to show that the entire argument is invalid. This was the projection that the price of scarce resources like aluminum would go up as high grade aluminum ores became exhausted. This did not happen. The model left out considerations of improvements in technology. This error was corrected in later editions, as were other small errors.

Nevertheless, despite some shortcomings, the simulation model at the core of *Limits to Growth* correctly identified the global environmental sustainability problem for the first time. Thus it is rather baffling to see that the same tool that was so good at *identifying* the sustainability problem has not been one of the main tools used in *solving* the problem. Why might this be so?

I suspect the reason is that system dynamics skills are rare and that fewer than 1% of people are true system thinkers. But still, that is no excuse. If an or-

ganization or an author does not have the right tools or the right skills, it needs to get them.

Another reason is that after *Limits to Growth* was published in 1972, there were numerous efforts to apply system dynamics to solving the problem. But these seem to have suffered from a grave, universal myopia. None focused on the crux of the problem, which is the social side of the problem or change resistance. Instead, like lemmings in lockstep, they focused on the technical side of the problem, *just as Limits to Growth had done*. And so they all went down the same blind alley and came up with nothing. The result was that over the years there were fewer and fewer projects applying system dynamics in a novel search for the solution.

And then there were none. Today, outside of my own work, I cannot find a single project applying system dynamics to the social side of the problem. But there must be some somewhere.

Taking up our assessment again, the immensely powerful tool of system dynamics allows us to *structure* our analysis of difficult complex social system problems instead of relying on an instinctive approach to determining why causes lead to effects, as the two books we are assessing have done.

Thus, for example, when *Treading Lightly* presents “The Nhunggabarra ‘Recipe’ [for sustainability]” on pages 170 and 171, the recipe pops out of nowhere. There is no logical, testable, calibrateable, structured model behind this list of 8 main points and 38 sub points. Nothing more than intuition is used to say these were the recipe items used to achieve sustainability. I found it very easy, for example, to question the third point: “Core Value: Respect.” As far as I can tell, the Australian Aborigines were driven by *fear of violating spiritual laws* more than anything else. That to me is their core value. The same could be said for point six: “Primary Resource: Knowledge.” From my viewpoint their primary resource was *superstition*. It drove their stories. It made them follow their laws. It explained how their world was created. From the vast treasure trove of superstition conveyed in their mythological stories one can find plenty of knowledge, but it arises out of superstition. Thus I would lean towards saying their primary resource was superstition. And so on. The entire recipe is a giant intuitive leap.

Personally I like many of the values listed in the recipe for sustainability. But for the purposes of answering the question of *why* the Nhunggabarra culture was sustainable and *how* we can apply that to today’s sustainability problem, they offer no useful convincing insights. Furthermore, which are the most important? Which are mandatory? Where can we find

the most value, the greatest leverage? It doesn’t say. This makes it impossible to begin to intelligently apply the recipe to today’s problem, unless you go back and do what the authors have not: build a system dynamics model and base your analysis on that.

However, the recipe is a useful list of data that can possibly be used in future studies. But in its present form, it does not convincingly answer any serious *why* questions. No structured examination of the system has been performed. Thus *Treading Lightly* scores a zero for this process element.

By now you may be as curious as I was: Does *Collapse* do any better on this process element, a true analysis of the problem is performed?

Of course, because *Collapse* is following a process. It may not be optimal, but it is a defined process with a defined approach to analysis, which is much better than none at all.

Actually *Collapse* does very well in this practice. A structured examination *has* been performed, using comparative analysis. On pages 11 to 15 Diamond discusses “a five-point framework of possible contributing factors that I now consider in trying to understand any putative environmental collapse.” This structures his examination by allowing his review of societies to build knowledge in these five areas. He is solving five little problems instead of one big one.

By comparison *Treading Lightly* has no such framework. This forces the authors to instinctively attempt to extract understanding from their review of a single society. The result is the giant intuitive leap they took to arrive at the “recipe” for sustainability. If they had structured their analysis of Aboriginal culture in the chapters leading up to the recipe, they would have been able to take much less of an intuitive leap, and more of a logical, analytical one. They would hopefully have decided not to use the word “recipe” at all, and “model” instead. The model would have explained *why* the Australian Aborigines, as Philip Bangerter of The Hatch Group put it, “had effectively

solved the issue of the race to the bottom, and I suspect, unwittingly, they had a permanent ability to detect corruption.”²

Such a model would have clearly showed the structure causing the outcome of a sustainable society. Once a desirable social structure of a past society has been identified, it becomes much easier to determine if it can be applied to a model of today’s sustainability problem.

Diamond structures his book by presenting his method of analysis, then collecting his data, and then interpreting it. The real meat for data collection is chapter 2, on *Twilight at Easter [Island]*. Diamond has done his homework, and goes deep into the more subtle elements of the entire collapse cycle. One reason he selected this case is “it proves to be the closest approximation that we have to an ecological disaster unfolding in complete isolation.” This, when it can be found, is a scientist’s dream, because it means that outside factors, which so often make the difference, were nil. The reasons for collapse could only come from within the isolated system of Easter Island.

I found this chapter absolutely fascinating. For me the real insights were the role of the political system in the building of the giant stone statues that became Easter Island’s biggest mystery when it was discovered by Europeans in 1722. There were hundreds, weighing up to 75 tons, on platforms weighing up to a mind boggling 9,000 tons. Who built them? It was so inconceivable that the islanders themselves did that some speculated that aliens from another planet must have come and put them there. However as Diamond explains, it was the dozen clans that controlled the island who put them there. “The clans competed peacefully by seeking to outdo each other in building [bigger and more] platforms and statues.”

Tragically, it was statue building that seems to have lead to Easter Island’s col-

Some readers may be offended by the use of the word **superstition**, which according to Wikipedia is “the irrational belief that future events are influenced by specific behaviors, without having a causal relationship.” But that is the exact shade of meaning that I wish to convey. To soften and sugar coat this by using words like unscientific, quaint, traditional beliefs, or factual beliefs people have been taught by their ancestors, would lessen the message of this paper. It would also encourage those who support superstitious beliefs, which includes religion and spirituality, to continue to resort to those cultural relics for guidance and support *when huge problems appear*, when what is needed in this modern day and age is not more reliance on superstition and intuition, but more reliance on science and reason.

For example, after the 9/11 attack, what did the leaders of the US government do? They sang “God Bless America” on the Capitol steps and went to church and prayed for God to deliver the US from further harm, and made sure the event was televised. President Bush and Reverend Billy Graham attended the Washington National Cathedral the Sunday after the attack, where Bush said:³

“This world He created is of moral design. ... On this national day of prayer and remembrance, we ask almighty God to watch over our nation, and grant us patience and resolve in all that is to come. ... And may He always guide our country.”

Graham added in his remarks:

“Yes, our nation has been attacked, buildings destroyed, lives lost. But now we have a choice: whether to implode and disintegrate emotionally and spiritually as a people and a nation, or whether we choose to become stronger through all of this struggle, to rebuild on a solid foundation.... And that foundation is our trust in God.”

Furthermore, according to a study of 8,600 adults:⁴

“In the immediate aftermath of the [9/11] attacks, half of all Americans said their faith helped them cope with the shock and uncertainty. The change most widely reported was a significant spike in church attendance, with some churches experiencing more than double their normal crowd on the Sunday after the shocking event. However, by the time January 2002 rolled around, churchgoing was back to pre-attack levels, and has remained consistent in the five years since.”

In other words, the initial response of US leadership and citizens was to turn to superstition for help on what to do *when a huge new problem appeared*. Much more constructive would be to turn to mankind’s greatest tool, reason, and seek answers and intellectual solace there. If you rely on superstition, then you are waiting for heaven to solve your problems.

lapse. Their movement from quarry to erection site required so many trees for logs and rope making that deforestation was complete by 1400 to 1600 AD. The island was colonized by Polynesians in 900AD, so self-destruction took about 500 years. Why did it happen?

The proximate cause was deforestation. The cause of that was competitive statue building. But what was the cause of that, when it must have been so obviously self-destructive? Diamond doesn't say, but promises to "return to this question in Chapter 14."

Chapter 14 is on *Why Do Some Societies Make Disastrous Decisions?* If there's anywhere in the book at true analysis is to be found, this is it. But as we discussed earlier, Diamond has already constrained himself to a black box model instead of a glass box model. All the comparative method can do is build a black box model of the correlations between inputs (causes) and outputs (effects). It cannot answer the why question the chapter poses.

Diamond solves this constraint by stepping out of the comparative method and into intuitive, event oriented interpretation of why Easter Island collapsed. He discusses the work of other researchers in collapse explanations, and concludes that we "have identified a baffling phenomenon: namely, failures of group decision making on the part of whole societies or other groups." He decides there is no one answer that fits all cases, and proposes "a roadmap of factors contributing to failures of group decision making."

Things begin to get interesting when on page 427 Diamond writes: (Italics added)

"The third stop on the roadmap of failure is *the most frequent, the most surprising*, and requires the longest discussion because it assumes such a wide variety of forms. Contrary to what Joseph Tainter and almost anyone else would have expected, *it turns out that societies often fail even to attempt to solve a problem once it has been perceived.*

"Many of the reasons for such failure fall under the heading of what economists and other social scientist term '*rational behavior*,' arising from *clashes of interest* between people. That is, *some people may reason correctly that they can advance their own*

interest by behavior harmful to other people."

Now we are getting into valuable insights that are so generic they can be applied to today's problem. Diamond tries to help us do exactly that, by pointing out that "three alternative arrangements have evolved to preserve a commons resource while still permitting a sustainable harvest." These are (1) enforce quotas, (2) privatize the resource, and (3) the users of the commons will spontaneously recognize their common interests and adopt prudent quotas themselves. The last occurs only under a set of restrictive conditions that sometimes do arise.

Recall that the second essential element of a true analysis is:

2. Diagnosis –The fundamental flaws causing the problem symptoms have been found. The patient has been diagnosed.

On page 431 Diamond strikes gold, as he arrives at the diagnosis: (Italics added)

"Chief among the forces affecting political folly is lust for power, named by Tacitus as 'the most flagrant of all passions.' As a result of lust for power, Easter Island chiefs and Maya kings acted so as to accelerate deforestation rather than to prevent it: their status depended on their putting up bigger statues and monuments than their rivals. *They were trapped in a competitive spiral.*"

Impressive. Without even formally deciding to use system dynamics, Diamond has used a little of it anyhow, by identifying the fundamental flaw causing the problem symptoms as "They were trapped in a competitive spiral." A "competitive spiral" is another name for a reinforcing feedback loop. Such loops can exert enormous pressure on social systems, as they did on Easter Island. Diamond has diagnosed why the patient suffered from the dreadful disease of unsustainability. Compared to similar analyses, this one is highly productive. *Collapse* scores a 4 on this process element, a true analysis of the problem is performed. It would have scored a 5 if it had used system dynamics to arrive at the diagnosis.

For those readers who may want to learn a little more about what a true analysis is, recall that the third essential element of a true analysis is:

3. Resolution space exhaustion – An exhaustive examination of the full range of solution alternatives to resolve those flaws has been conducted.

Neither book needed to do this because their goal was only to answer the question of *why* past societies were sustainable or not. But suppose they wanted to perform a full true analysis. How would they do it?

The key would be a problem solving process that fit the problem. This would include a correct approach to analysis. As a second edition of *Treading Lightly* or *Collapse* moved along, it would be structuring its collection of data into a glass box model of the problem. Once the model represented enough of the right data it would be able to explain why the problem symptoms were occurring, not just at a superficial level, but at a deeper level, one deep enough to qualify as the fundamental causes of the problem. At this point the root cause of the problem has been diagnosed.

(A great benefit of building a dynamic model as data collection proceeds is you will know when you can stop collecting data. This occurs when the model can explain what you want it to. This avoids the common tendency of collecting far more data than necessary, and not collecting the data that is necessary.)

Because the second editions have performed steps 1 (structure) and 2 (diagnosis) of a true analysis so well, step 3 (resolution space exhaustion) has changed from impossible to possible.

The output of the diagnosis step is the fundamental flaws causing the problem symptoms. For example, on Easter Island the flaw was “They were trapped in a competitive spiral.” A competitive spiral would be a key part of the simulation model. The structure of that model could then be examined for hypotheses (solution alternatives) on how to resolve the flaw.

The collection of hypotheses that could do this is the “resolution space.” This is millions of times smaller than the total “solution space.” Thus there is no need for a far ranging “solution space search,” which would be a search of all possible solutions. Instead, steps 1 and 2 of the analysis have reduced

that space to just the collection of solution alternatives that would resolve the flaw. This is such a smaller space, with well defined alternatives, that searching it exhaustively is possible, as opposed to impossible if the entire solution space must be searched.

The point is that if books like Treading Lightly and Collapse want to make even more significant contributions to solving the sustainability problem, they need to perform at least steps 1 and 2 of a true analysis, using the tools necessary to build a glass box model. Only then will readers be able to apply the sustainability lessons from the past to the sustainability problem of today.

Process Element 7: The Scientific Method is used to prove all key assumptions

The Scientific Method is the only known method for producing reliable new knowledge. Without reliable knowledge problem solvers cannot build conclusion upon conclusion reliably, which prevents building a complex analysis or a complex solution. Only simple analyses or solutions can be built using unreliable knowledge. Therefore any attempt to solve the sustainability problem, or to provide valuable new insights for doing that, must be based on the Scientific Method.

All such attempts will have an argument consisting of premises, intermediate conclusions, and final conclusions. Each one of these is an assumption. The key assumptions in the argument *must* be proven using the Scientific Method, or users of the argument will have no idea whether it is sound or not.

There is a stark contrast between the use of the Scientific Method in *Treading Lightly* and *Collapse*. The former frequently makes key assertions that are unsupported by proof, while the latter rigorously tries to prevent any untested knowledge from creeping into the argument. For this reason *Treading Lightly* scores a zero while *Collapse* scores a 4 for highly productive.

For example, chapter 7 of *Treading Lightly* covers *The Fourth Level* of Australian Aboriginal society. This is the “spiritual realm.” I had a strong negative reaction to this chapter, because I do not believe in spiritual things, psychic powers, precognition, or sacred places (all of which were presented as true in this

chapter), because there is simply no scientific evidence these beliefs are true. But the authors of *Treading Lightly* try as hard as they can in this chapter to make me a believer. This is an unprofessional approach and throws the entire book into suspicion.

Page 144 lists Aboriginal intangible breakthrough discoveries. Included are “Crystal healing - Rediscovered [in the Western world] but not generally accepted in society” and “Telepathy – Known [in the Western world] but not accepted by mainstream science.” Really? Crystal healing and telepathy work? The authors have proof? If so, that is the book they should be writing and not this one.

On page 147 the book says “They seem to have possessed psychic powers that are largely lost or considered taboo in mainstream modern Western civilization. Their ability to apply such powers was the highest level of knowledge of the Nhunggabarra.” Really? Where is the proof that “psychic powers” ever actually existed? They are not “taboo” in Western civilization, which is the strawman fallacy. They are considered unproven, along with the ability to change anything through prayer, an afterlife, astrology, the Indian rope trick, contacting the dead through spiritual mediums, and so on.

Finally on pages 159 and 160 the authors make a supreme effort to convert readers to belief in the supernatural, with this preposterous appeal:

“Have we found the spot from which the wiringins contacted and then traveled to the spirit world?

“I decide to take a picture of the ‘circle.’ It is late in the afternoon and the sun is setting in the west and when I aim the camera I notice that my shadow is cast straight into the circle. Something tells me that this is an important moment and on impulse I ask Tex and Anne to join me, so the shadows of all three of us fall into the circle. We try to fit the shadows of our heads in the center.

“According to Nhunggabarra belief, the shadow is one of the four spirits of a person and we are very careful to ensure our shadows do not cross each other. By letting our shadows fall into the circle we are in effect allowing our spirits to enter a possible danger zone.

Some readers may feel the use of the term **unprofessional** is overly harsh. To me **professional** means adherence to the norms of a profession. The back cover of *Treading Lightly* says “A Scandinavian knowledge management professor meets an Aboriginal cultural custodian and...” The introduction states that “The analysis is primarily based on qualitative data and the main sources come from oral tradition. For this reason, reliability and validity merit special attention. The methodological approach is to combine the Nhunggabarra stories with as many different sources as possible: written sources, site visits and interviews. Whenever possible, at least three sources have been combined: a story, a written source and a visit to the site in the story. This is a validation method familiar to qualitative researchers and is known as triangulation.”

In addition, there are five pages of references and sources at the end of the book. All this signals to me that the professor, who is the actual author, will take an academic, scientific approach. This is not just a book for general readership. It is also for other professors and scientists. The author has clearly committed himself to deliver a scholarly, scientific work.

Thus when the professor attempts to convince the reader that the “spiritual realm” and numerous other pseudoscience cause-and-effect behaviors physically exist, without proof, my alarm bells go off. *They have grossly violated the norms of the profession of academic research.* This could have been avoided by the author saying “I’m stepping out of my academic shoes to make a personal observation, without proof” or such.

Authors who mix science with popular writing have an obligation to be both scientific and readable. This is not easy to do, so praise and readership comes to those who can do it well, as it has to the author of *Collapse*. But it does not come to those who are unable to screen out unscientific ideas, unless they are writing to an unscientific audience from the start, such as Bjorn Lomborg’s *The Skeptical Environmentalist* or Daniel Quinn’s *Ishmael*.

We are very silent. I take the picture. It is hard to express what we feel and why we feel

it, but Tex's comment covers it well. 'I would not like to spend the night here.'

"In the evening of the next day, back in our Goodooga base camp, I go through my photographs to catalog them. I note a strange spot on the picture. It looks like a dark object with fuzzy edges in the sky.

"What is it? I can rule out a flaw in the camera, because none of the other pictures contains a smudge. I can also rule out it being a reflection of the sun in the camera lens, since I was pointing the lens away from the sun. None of us had seen anything in the sky when we took the picture.

"I run the picture through software with a number of different filters in my computer. The results reveal that the spot consists of an oval core surrounded by several layers, which makes it resemble a vibrating or rapidly turning 'hole' surrounded by vibrations of another density.

"The 'ring' has a connection behind it with something further away. The whole thing looks like a tube with the opening directed towards us and the rest of the tube connected behind the opening into the distance.

"I show the picture to Tex and Anne. Tex makes some estimates and says: 'Can you see the direction of the connection? Southeast. That's where the Southern Cross and the Milky Way would be visible in the night sky.'

"We get goose bumps..."

Here the implied hypothesis is that the photograph shows a tunnel to the spirit world. The proof is that there is no other explanation that could be found.

This is gross misunderstanding of what the Scientific Method is. It says that to accept a hypothesis as probably true, you have to try very hard to falsify it, and the phenomenon must be repeatable. The authors of *Treading Lightly* did neither, and appear to be very biased toward accepting this hypothesis. There are thousands of reasons smudges have appeared on millions of photographs, whether digital or film. Saying that "I can rule out a flaw in the camera, because none of the other pictures contains a smudge." does not rule out a flaw in the camera, because a flaw can show

up in only one in a thousand photographs. Saying "None of us had seen anything in the sky when we took the picture." does not rule out that there was something there, because the group did not make an exhaustive review of the sky as they took the picture. They were looking at their shadows.

If the authors did feel the hypothesis is highly likely to be true, then before publishing they should have made a serious effort to replicate the phenomenon. They did not.

Aggressive attempts to falsify a hypothesis and to replicate the phenomenon are standard scientific practices. Not following either is a telltale sign that the authors are not scientists. They are something else.

For asking the reader to believe in spiritual things, psychic powers, precognition, sacred places, crystal healing, telepathy, and tunnels in the sky leading to the spirit world, *Treading Lightly* scores a zero on this process element.

There are innumerable further examples of ignoring the need to prove all key assumptions with the Scientific Method. The two pages on the 'recipe' for sustainability contain 8 main points and 38 sub points, none of which have been subjected to even a modest form of proof that it is essential to a sustainable culture and is anything more than a coincident symptom (This term is explained shortly).

On page 206 *Treading Lightly* makes its final assertion: a summary of its solution to "sustain our world." This is very briefly presented as:

"What could a sustainable modern society look like? Some of the keywords of the Nhunggabarra were 'respect', 'intangibles', 'community building' and 'ecosystem care.' How could we make these concepts our own in order to save our world?"

The hypothesis is that making these keywords "our own" would "save our world." Nowhere in the book do the authors attempt to prove this will work, by showing it worked in the past and is transferable to the present. They simply make the grand leap to the assumption that it should.

But putting aside the quibble that the hypothesis is untested, there is a strong logical reason why it will not work anyhow. This is because the authors have

fallen into a common trap, one that frequently snares those who rely on intuition to solve difficult complex social system problems. The authors are confusing causes with coincident symptoms.

Coincident symptoms are system behaviors that appear right along with the main problem symptoms. Both are the result of deeper fundamental causes of the problem. Treating coincident symptoms will not solve a problem, because treating symptoms never solves a problem. Only treating the underlying cause will solve it. You cannot cure appendicitis by giving a patient lots of pills to control the pain and fever, which are the chief symptoms. Neither can you cure it by treating the coincident symptom of loss of appetite due to digestive tract blockage.

Here's why each of the four keywords is a coincident symptom:

Respect – A sustainable society would be one with inherent respect for the environment. Otherwise it would carelessly destroy it.

Intangibles – This refers to the emphasis of a society on non-physical goods and services. This too is a byproduct of a sustainable society. As environmental limits or any constraint forces production of physical goods and services down, emphasis on quality of life and the intangibles goes up, as people seek to do something with their surplus time and income.

Community building – A global sustainable society will invariably be accompanied by a cooperative effort. This will invariably filter down to the community level, where sustainable communities will be a foundational element. Whatever will cause global cooperation will also cause community cooperation and community building.

Ecosystem care – This is a simple tautology. Environmental sustainability is ecosystem care.

Next let's turn our attention to *Collapse*. Physical evidence is used to prove the theory behind the collapse of Easter Island. Diamond limits his hypotheses to a small number through the use of his five point

framework, which constrains his key hypotheses to just five factors. When he leaves this framework in the chapter on *Why Do Some Societies Make Disastrous Decisions?* he goes through great care to not make giant intuitive leaps, which are usually indefensible. Instead he makes small, logically sound jumps, from proven premises and intermediate conclusions.

For these reasons *Collapse* scores a 4 for highly productive in its use of the Scientific Method to prove all key assumptions. It would have scored a 5 if Diamond had used system dynamics to build his argument, because simulation models are much easier to test for falsehood.

Process Element 8: Learning from past failures and successes is maximized

Both books cover such a short time span that this element does not apply. They both score the default, which is a zero. However I expect that Diamond learned a lot from his 1997 book, *Guns, Germs, and Steel: The Fates of Human Societies*, that was able to help him in planning and writing *Collapse*.

Problem Domain Key Best Practices

Next we assess process maturity for the three key best practices for the problem domain, which is the type of problem. Analytical Activism is a generic process. For it to be fully effective it must be tuned to the particular problem at hand. This is accommodated by the second step of the Analytical Method, which is to choose a process that fits the problem.

From the point of view of how to best approach solving it, the defining characteristic of the global environmental sustainability problem is that it is a *complex social system problem*. This is the problem domain. The three best practices that follow address this type of problem.

Process element 9: The analysis centers on a social system structural analysis

Complex social systems have several characteristics that make them difficult to understand. They are composed of *independent agents*. Because of this such systems are adaptive. *They adapt their behavior* to changing circumstances, from within and without. They undergo *spontaneous self-organization*. They are *tightly coupled*, so that it is impossible to change

one part of the system without affecting the rest. They are *nonlinear*, meaning effect is rarely proportional to cause. They are *counterintuitive*, because the behavior of the whole is much more than the sum of the parts. They are *resistant to change*, and tend to absorb most changes and return to about the same equilibrium. They have so many parts and connections of so many different types that *their behavior cannot be calculated with certainty*, as can simple systems.

It is for all of the above reasons that problem solvers need to use system dynamics as their main analysis tool. Applied correctly, this allows an analysis to center on the social structure of the system with only a modest amount of effort.

System dynamics is the only known method of explaining complex social systems behavior with any real depth, so its use is mandatory on the sustainability problem. But where do we see it in *Treading Lightly*? It is barely visible. Pages 173 and 174 mention “a carefully balanced model with checks and balances and reinforcing loops” and the power loop, the value-creation loop, and the knowledge building loop. Page 205 mentions “the elements [of the recipe] both reinforce and balance each other.” Perhaps the authors are aware of the tool of system dynamics. But there is nothing more than this brief appearance, which appears to be tacked on as an after thought. *Treading Lightly* scores only a 1 for very low productivity on this process element.

Collapse does not do much better. It does answer the why question in terms of feedback loops when it concludes on page 431 that:

“As a result of lust for power, Easter Island chiefs and Maya kings acted so as to accelerate deforestation rather than to prevent it: their status depended on their putting up bigger statues and monuments than their rivals. *They were trapped in a competitive spiral.*”

This is an important insight, expressed in terms of a dominant feedback loop that pushed a system to collapse. But unless I missed it, the rest of the book does not use system dynamics anywhere. Thus *Collapse* scores only a 2 for slightly productive.

Process Element 10: Low and high leverage points have been identified and tested

The strategy for analyzing and solving difficult complex social system problems must employ *leverage point analysis*. This is because problem solvers, particularly activists, have only a very small amount of force (numbers, wealth, and influence) to apply. Any force that problem solvers exert on the system is going to be counteracted by the system pushing back. It is therefore imperative to find the right places to push.

Leverage is the ratio of change in input to change in output. A **leverage point** is a place in a system where force can be applied. A *low leverage point* is a place in a system where a small amount of force causes a small change to system behavior. A *high leverage point* is a place in a system where a small amount of force (the effort required to prepare and make a change) causes a large amount of predictable response.

At a favorable high leverage point a small structural change to a system can cause the system to behave much more favorably. *Only the use of the correct high leverage points can solve a difficult complex social system problem, because if a low leverage point is used, system resistance cannot be overcome.*

If solution failure has occurred for awhile, then low leverage points are invariably where problem solvers have been pushing. This is because they are intuitively attractive but do not offer enough leverage to solve the problem. They are intuitively attractive because, you guessed it, an intuitive approach at problem solving has been used instead of an analytical one. An example of an attractive low leverage point is “more of the truth.” This is explained in *The Dueling Loops of the Political Powerplace*.

Leverage point analysis is not a common practice, so we should not expect to see much of it in these books. Sure enough, the concept exists in neither book. But then again, should it? These books are only trying to find out *why* past societies collapsed or not, and what can be applied from those lessons to today’s society. Would leverage point analysis help there?

It would help tremendously. A society near its environmental limits needs the appropriate balancing feedback loops to prevent overshoot. Keeping those loops strong enough to counteract the force of rein-

forcing loops driven by competitive agents requires leverage, because social systems tend to do poorly in balancing those reinforcing loops. They keep running away and causing small and large catastrophes. As proof, consider the continual occurrence of wars, assassinations, political upheaval, environmental collapse, and economic collapse throughout history. Only the fine tuning of the human system through the use of high leverage points has been able to tame this continual stream of system upheavals. Somewhat.

Thus if a study of why a system was sustainable or not used leverage point analysis, it would find deeper, more foundational reasons why. And, because the act of modeling the system always abstracts out what is important and ignores the rest, the results would be more transferable to other systems, such as today's.

This process element therefore does apply to these books. But because there is not the slightest hint of its use, both score a zero.

Process Element 11: Why change resistance is so successful has been determined. (Diagnosis of root cause)

What makes difficult complex social system problems difficult is the presence of change resistance. If it's not there then the problem is not difficult at all, and is more a matter of finding the most efficient technical solution. If it is there, then the root cause of the problem is whatever is causing change resistance at the fundamental level of the structure of the system. *Until the cause of change resistance is known a difficult problem cannot be resolved intelligently.* Only guesswork can be used.

Treading Lightly studied a culture where change resistance was not an issue, since the Australian Aborigines had apparently always been sustainable. The book receives an automatic default of zero for this element.

Collapse studied many past cultures. Most collapsed. On page 419 Diamond asks a key question about Easter Island: "How on earth could a society make such an obviously disastrous decision as to cut down all the trees on which it depended?"

The question implies the notion of change resistance. The Easter Islanders were unable to stop themselves. They could not change their obviously self-destructive behavior.

Diamond is fully aware of this and more. He *structures* his approach to answering the question in this manner, on page 420:

"My UCLA undergraduates, and Joseph Tainter as well, have identified a baffling phenomenon: namely, failures of group decision-making. This is obviously a complex subject to which there would not be a single answer fitting all situations.

"What I'm going to propose instead is a road map of factors contributing to failures of group decision-making. I'll divide the factors into a fuzzily delineated sequence of four categories. First of all, a group may fail to anticipate a problem before the problem actually arrives. Second, when the problem does arrive, the group may fail to perceive it. Then, after they perceive it, they may fail even to try to solve it. Finally, they may try to solve it but may not succeed."

The four factors contain progressively more change resistance, which ranges from fairly hidden and systemic to obvious and due to particular sources. The fourth category is where we are today. We have perceived the sustainability problem and are trying to solve it, but there is currently too much change resistance to prevail.

This is good understanding of the phenomenon of change resistance. But has Diamond determined why change resistance has been so successful? The type we are interested in is the category four type, where change resistance is obvious and due to particular sources. While what those sources are may not be obvious, the presence of change resistance is.

On page 432 and 433 Diamond discusses category four. Throughout the book he never uses the term change resistance or a similar concept, so his writing seems overly intuitive and laborious here, and not well structured. He wanders through "irrational behavior, i.e. behavior that is harmful for everybody," being torn by clashes of values, the sunk cost effect, religious values, secular examples of clinging to values when under new circumstances they no longer make sense, and so on. He does explain why particular past societies that perceived the problem failed to solve it. Thus we must give him high marks in this area.

But Diamond falls short on Easter Island. He places them in category three, societies that perceived the problem but did not try to solve it. To me this is erroneous. After all, he opened the chapter with the question “How on earth could a society make such an obviously disastrous decision as to cut down all the trees on which it depended?” We will never know, but I suspect that a minority of Easter Islanders could see disaster ahead, and wanted to take action, but they were unable to stop the clans from competing to see who could build the biggest and the most statues. If they felt powerless to do anything, were unable to stop it, or if dissenters were punished, those are all forms of change resistance. Using the concept of landscape amnesia to place Easter Island in category three seems to be oversimplification.

Diamond also does not use structural analysis to determine why change resistance succeeded. As a result, his reasons for it seem superficial. There is no deep analysis of political systems to construct a general theory. Instead there is only very broad, light coverage of dozens of possible reasons that societies that perceived doom was ahead were unable to avoid it.

Given the superficiality of Diamond’s analysis of change resistance, the result is low productivity. The findings do not contain anything of real value. They seem to be more at the level of coincident symptoms that underlying structural causes. For these reasons *Collapse* scores a 1 for this process element.

The Process Maturity Rating

The higher the process maturity, the greater the productivity, and hence the greater the contribution a problem solving effort can make.

To arrive at the process maturity rating, the adjusted score is squared. Squaring is used because relative productivity due to process maturity varies exponentially. For example, consider two school children, one in the 10th grade and one in the 12th grade. The 12th grader will run circles around the other one in difficulty of the problems they can solve, and the different types of problems they can solve. The same holds for chess ratings. A difference of only 10% doesn’t mean one player will win 10% more games. They will win nearly all of them. The same holds for the Software Engineering Institute’s five level Capa-

Process Maturity Assessment					
Process Element	Wt	You		Your Org	
		Raw	Wtd	Raw	Wtd
Classic Activism Steps 1, 2, 3, and 4					
1. Identify the problem	1				
2. Find the proper practices	1				
3. Tell the people the truth about the problem and the proper practices	1				
4. If that fails, exhort and inspire the people to support the proper practices	0				
Analytical Activism Key Best Practices					
5. Formal definition, management, and continuous improvement of a process that fits the problem	4				
6. A true analysis of the problem is performed	3				
7. The Scientific Method is used to prove all key assumptions	3				
8. Learning from past failures and successes is maximized	2				
Problem Domain Key Best Practices					
9. The analysis centers around a social system structural analysis	2				
10. Low and high leverage points have been identified and tested.	2				
11. Why change resistance is so successful has been determined. (Diagnosis of root cause)	2				
Total score on scale of 0 to 100					
Adjusted score for automatic zeros					
Process Maturity Rating = Adj. score squared, on a scale of 0 to 10,000					
Mission success					

bility Maturity Model. As an organization moves up the five levels, productivity increases by a factor of 2 or more, with the biggest gains at the higher levels.

Treading Lightly has an adjusted score of 24. Squaring this gives a process maturity rating of 576. *Collapse* has an adjusted score of 59 and a process maturity rating of 3,481, which is six times that of *Treading Lightly*.

In the chapter on *An Assessment of Process Maturity*, the results were that organizations or books with ratings below about 1,000 achieved low mission success. Those with ratings from 1,000 to 5,000 achieved medium success, and those above 5,000 had high mission success. The ratings and mission success of *Treading Lightly* and *Collapse* fit this pattern, because they achieved low and medium mission suc-

cess. *It is this pattern that is the central message of this paper.*

Treading Lightly came nowhere close to answering the question “What can we learn from the traditional Aboriginal lifestyle to create a sustainable society in modern Australia?” This is why it achieved low mission success.

Collapse did much better, but even it did not score a home run. Its driving question was “What caused some of the great civilizations of the past to collapse into ruin, and what can we learn from their fate?” It answered the first part of this question well but not the second, and thus achieved only medium mission success.

Summary and Conclusions

This paper is not your normal book review. It is an analysis of how these two books attempted to go about fulfilling their premises. It is an objective analysis, because the approach is replicable. More importantly, it is an *educational analysis*. Rather than educate readers of this paper about the books themselves, we have been studiously trying to explain the fundamental reasons why so many efforts like these have failed to make significant contributions to solving the sustainability problem.

Looking at past societies, the sustainability lessons are there, if only we can find them. But the lessons this paper considers the most important are not direct practices like resolving competitive spirals. *The more important lessons are that a true analysis must be performed and the process must fit the problem.* These are the lessons we hope you carry away from this paper and put into practice.

If you do, one way to start would be to perform an assessment of your own problem solving approach. This will pinpoint where the smallest amount of improvement will have the greatest benefit.

And then, if that assessment offers valuable insights, you might consider taking a bigger step: Performing an assessment of your organization. It will not take long. But the return on investment may be the biggest one that you, and *Homo sapiens*, ever made.

Endnotes

¹ The definition of best practice is from en.wikipedia.org/wiki/Best_practice, which contains a good introduction to the philosophy of best practices. The article begins with:

“In business management, a best practice is a generally accepted ‘best way of doing a thing.’ A best practice is formulated after the study of specific business or organizational case studies to determine the most broadly effective and efficient means of organizing a system or performing a function. Best practices are disseminated through academic studies, popular business management books and through ‘comparison of notes’ between corporations.”

² Private communication, July 5, 2006. It was Philip who recommended reading *Treading Lightly*, in hopes that it would shed further light on the analysis and sample solution elements presented in *The Dueling Loops of the Political Powerplace*.

³ The Bush and Graham quotes are from www.highbeam.com/doc/1G1-92083565.html.

⁴ The study quote is from www.barna.org/FlexPage.aspx?Page=BarnaUpdate&BarnaUpdateID=244.