Chapter 18

Analysis of the Social Proper Coupling and Model Drift Subproblems

In the previous chapter the Dueling Loops model explained the root cause of why change resistance is so successful and how, if solutions push on the right high leverage point, that change resistance could be overcome.

These are deep insights. But they are not enough to solve the sustainability problem. So far we've only explained why change resistance is successful. We have not explained why it occurs in the first place. What is the source of that change resistance?

We have also not explained why the most beneficial form of government known, modern democracy, has failed to proactively solve the sustainability problem while it was still small and easily solved. Democracy clearly should be solving the problem, because global environmental collapse would cause untold suffering and death to billions of people. Such mega problems must be nipped in the bud and solved proactively long before they arrive, because once they arrive they weaken the human system so severely that the system becomes too weak and distracted with short term crises to solve the problem.

The source of change resistance is the social proper coupling subproblem. Failure to proactively solve the problem is the model drift subproblem. These are huge problems and require considerable analysis to penetrate. This chapter attempts to do that with these steps:

1. The five substeps of the analysis step of SIP are performed on the social proper coupling and model drift problems.
2. More loops are added to the Dueling Loops model, so it can support the above analysis.
3. A series of simulation runs are presented. These bring the model and analysis alive. The runs show how the human system behaves in the large according to the analysis. The purpose of the runs is to enhance your mental model of the problem so that you can vividly and correctly see what the root causes are, how they can be resolved, and how the system will respond to various solutions.
4. Finally we present some bad news. Systemic change resistance is so high it appears we can't start pushing on the high leverage point identified in the previous chapter. Civilization is stuck.

Analysis of the social proper coupling subproblem

Proper coupling occurs when the behavior of one system affects the behavior of other systems in a desirable manner, using the appropriate feedback loops, so the systems work together in harmony in accordance with design objectives. **Social improper coupling** occurs when some type of social system is improperly coupled to another system. The symptoms of social improper coupling are painfully obvious: large for-profit corporations are dominating political decision making destructively. They are so successful at dominance they have essentially become the New Dominant Life Form, as explained on page 227.

These symptoms occur because the dominant two life forms in the human system, large for-profit corporations and humans, are improperly coupled. This must be so because if they were properly coupled they would be cooperating and in full agreement on issues like how to solve the sustainability problem. But they are not, which is the problem column B of the *Summary of Analysis Results* on page 202 seeks to solve.

Here's how we arrived at the conclusions summarized in column B:

Substep A. Find the immediate cause of the problem symptoms in terms of the system's dominant feedback loops.

The previous chapter presented the basic Dueling Loops model, which makes this substep easy to perform. **The Race to the Bottom among Politicians** is the dominant loop most of the time. That loop is the immediate cause of high systemic change resistance. It's also the immediate cause of social improper coupling because it is large for-profit corporations who are driving exploitation of the loop.

Thus a dominant Race to the Bottom is the immediate cause of two subproblems. It explains the *success* of change resistance. It also explains the *source* of that change resistance, which leads us into substep C. But first we perform substep B to get the complete picture.

Substep B. Find the intermediate causes, low leverage points, and symptomatic solutions.

The symptom of social improper coupling is large for-profit corporations are dominating political decisions whose outcomes favor corporations. Lacking a formal process for finding the root cause, classic activists have settled for an *intermediate cause*, which they see as disagreement from corporate proxies on what to do to solve the sustainability problem. To them that's perfectly obvious. Just as obvious is how to strategically solve the disagreement problem (the *low leverage point*). Logical and emotional appeals to social norms, along with bargaining, should work. How can that be done? That's easy. All activists have to do is get clever and try new approaches, like corporate social responsibility (CSR) appeal, green investment funds, NGO/corporate alliances like the Apollo Alliance of labor, business, environmental,

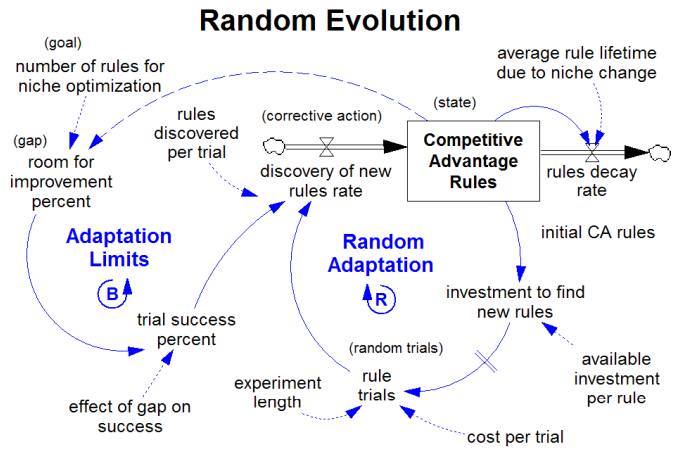
and community leaders, and so on. Because these solutions attempt to solve a problem by resolving its intermediate cause, they are *symptomatic solutions*. That's why they have largely failed.

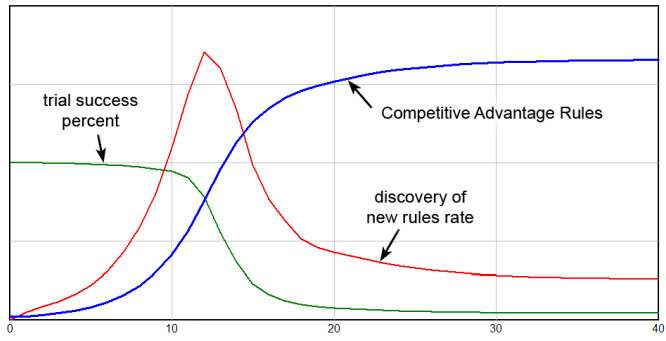
Substep C. Find the root causes of why the loops in A are dominant.

Why the Race to the Bottom was dominant was a question that haunted me for years. Digging deeper and deeper, many false leads appeared. Could it be explained by game theory? No. That only explains social agent strategies. It doesn't explain why they want to win so badly. Could it be explained by wrong values? If corporate managers behaved responsibly then they would not want to exploit the race to the bottom. Corporate Social Responsibility campaigns were trying this solution route. But they were failing miserably. It was like preaching to the choir. Only the few corporations who were already pro-sustainability listened. The rest listened to something else: the call for ever increasing profits.

The digging continued. What is the root cause of social improper coupling? Why are corporations pushing **The Race to the Bottom among Politicians** so hard? The answer remained elusive. It was like chasing something that wasn't there.

But digging deeper, and deeper, and then a little deeper led to realization that hidden somewhere in evolutionary theory must be the answer. Poring through the history of evolutionary theory, its many principles, and its applications, I've come to believe the answer is captured in the model shown.





Evolution is ultimately *the* driver of all human and social behavior. Therefore the root cause of social improper coupling must lie somewhere in the evolutionary algorithm.

The algorithm consists of cycles of replication, mutation, and selection. For the two replicators we are concerned with, genes and memes, a replication is an experimental trial. For genes each trial is a new generation. For memes each trial occurs when a meme attempts to infect a new mind. In both cases the life form is genetically or mimetically defined by its collection of rules. These provide it with the competitive advantage it needs over competitors to survive in and ideally dominate its niche. The rule set for genetic life forms is carried in its DNA. Memetic life forms live in human minds, where a large collection of memes make up each memetic life form occupying a mind. For both types of life forms rule types include goals, principles, facts, and procedures. Knowledge of a rule set is all you need to know to predict the general behavior of a life form. At its core, mental life consists of using a rule set and one's own memories to remember things, interpret experiences, and make decisions. The better the rule set the greater the competitive advantage of a life form. Physical life consists of acting on decisions and collecting input for memory and further decisions.

Genes make up a species. Memes make up a mecies. A **mecies** is a collection of memeplexes that has copies in many minds and actively uses those minds as proxies to achieve its ends. A **memeplex** is a collection of memes. For a full description of mecies see this endnote. [117] Excluding robots, all life forms on Earth are species or mecies. Examples of species are plants, animals and people. Examples of mecies are cultures, nations, corporations, religions, and political parties. The random mutation evolution algorithm applies equally well to species and mecies.

Here's how the **Random Adaptation** loop works: The initial value for Competitive Advantage Rules is one rule. This represents a very simple life form, such as an amoeba, that has very low competitive advantage. If it can evolve to accumulate more it may become a shark or, evolving in a radically different line, a virus. Or if it's a mecies with the single rule of "waste not want not," it might grow into a philosophy as all-encompassing as the sustainability movement.

Whatever the life form is, a species or a mecies, it makes investments in trials. Species invest in producing offspring. Mecies invest in producing successful variations of themselves in new minds. This effort is represented by the investment to find new rules node. The more rules accumulated in the Competitive Advantage Rules stock, the higher the available investment. The investment times cost per trial equals the number of rule trials that will be run. The number of trials times trial success percent times rules discovered per trial equals the discovery of new rules rate. This increases the stock of rules and the **Random Adaptation** loop starts over again. It's a reinforcing loop, so it grows until it reaches its limits.

The limits are provided by the **Adaptation Limits** balancing loop. As the stock of rules rises, room for improvement percent goes down. As this falls so does trial success percent. This in turn causes discovery of new rules to slow down. The balancing loop keeps the stock from rising above the number of rules for niche optimi-

zation, which is 100. This reflects the principle that a life form can only evolve so far in optimizing use of a niche. Once it's reached optimization the species or mecies is relatively stable because pressure to evolve any further disappears.

What the model has captured so far is conventional evolutionary theory as applied to genes. But the model also applies to memes because of this principle: *Social behavior is caused primarily by the evolution and expression of memes rather than genes.* Genes mutate randomly. There is no one deciding exactly what the genes in a new seed, child, or baby bird will be (genetic engineering is changing this). However, memes mutate randomly or intelligently, whichever is more opportune. A wild guess as to how to design a more efficient form of government is a random mutation. But if a circle of founding fathers deliberates for months, they can intelligently create the new mutation that has become modern democracy. *The great advantage of mecies over species is they can self-evolve intelligently rather than randomly.*

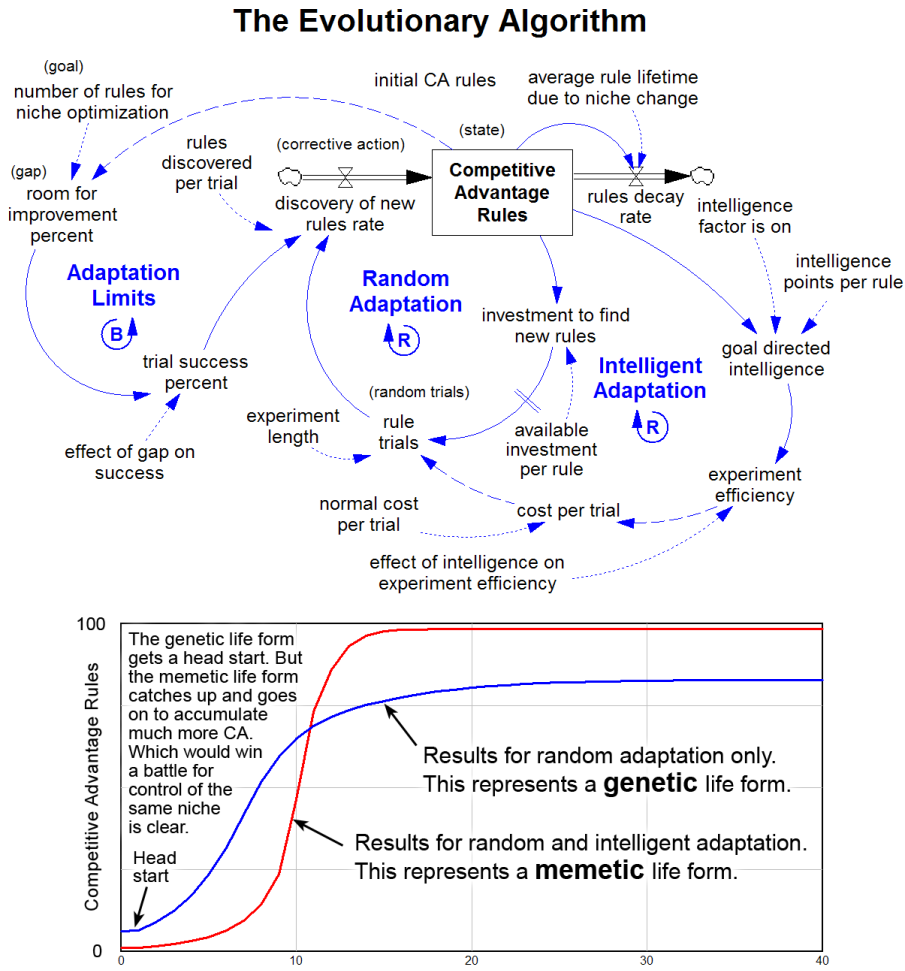
Therefore, for the model to be complete it needs to include *intelligent* mutation, as captured on the next page. This is a sufficiently complete model of the basic algorithm of how genes and memes evolve. Until social scientists start applying memetic life form theory to social problems, sociology will remain where biology was before Darwin.

The graph shows how **Intelligent Adaptation** causes an overwhelming difference. If two life forms, one genetic and one memetic, compete in the same niche, the memetic one will trounce the genetic one, even if the genetic life form has a head start. Richard Dawkins recognized this in 1976 when he wrote the following in his chapter on *Memes: the New Replicators:* [118]

> I think that a new kind of replicator has recently emerged on this very planet. It is staring us in the face. It is still in its infancy, still drifting around in its primeval soup, but already it is achieving evolutionary change at a rate that leaves the old gene panting far behind.

In the model, **intelligence** is any form of goal directed behavior based on reasoning, as opposed to random behavior. The more intelligent an organism is, the more often, efficiently, and faster it will achieve its goal. The **Intelligent Adaptation** loop assumes that as the Competitive Advantage Rules for a life form increase, so does its goal directed intelligence. As this rises so does experiment efficiency. As this goes up cost per trial goes down. As that goes down, investment to find new rules goes further, so the number of rule trials goes up. This increases the discovery of new rules rate dramatically, as the graph demonstrates.

The graph shows two simulation runs. The run for random adaptation (genetic life forms) starts with six rules. The other run (memetic life forms) starts with only one rule. Despite this handicap the memetic life form pulled ahead and reached an eye popping 98 out of the 100 of rules needed for complete niche optimization. The genetic life form was left panting far behind with 83 rules because, reasoned Charles Darwin in *The Origin of Species*, "As natural selection acts solely by accumulating



slight, successive favorable variations, it can produce no great or sudden modification: it can only act by way of short and slow steps."

The Principle of Competitive Exclusion

Before presenting the argument for what the root cause is, we need one more premise. According to the **Principle of Competitive Exclusion**, when two life forms occupy the same niche, only one outcome is possible: One life form will drive out the other. If any of the other remains, it is only because its members have *adapted*, and are now living in a slightly different niche. Here's how the principle was discovered: (Italics added)

> "Georgyi Gause, the Russian microbiologist... interested in competition, discovered this principle. Gause inoculated a simple, finite culture with Paramecium, and... got logistic population growth. These Paramecium eat

bacteria, and there is only so much food in a culture to support a certain number of Paramecium.

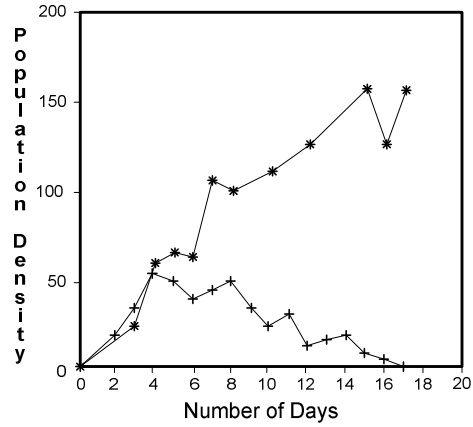
"Then he put two [different] species of Paramecium in the same culture. He got lowered growth rates of both populations. *Even more interestingly, one species always drove the other to extinction.*

"This led Gause to come forth with a famous 'principle' that would dominate ecological research for nearly the entire century: *Two species that use resources exactly the same way cannot coexist. One will drive the other to extinction."* [119]

The data from one of Georgyi Gause's actual experiments is shown. It tells a clear story.

The Principle of Competitive Exclusion allows us to see what's really happening here. Two life forms, one genetic and one memetic, are battling for control of the biosphere. According to the principle, the loser must adapt to a different niche or go extinct. There are no other choices.

It appears that *Homo sapiens* has chosen adaptation rather than extinction, so he is now subservient to the modern corporation and its allies. Depending on your point of view, his new niche is a powerless employee and consumer, or a *Corporatis profitis* slave. Perhaps it's all three. This transition is still in progress in the less industrialized areas of the world.



Results of competition between two species of Paramecium with similar requirements. Both did well for four days. After that the species represented by the lower curve was driven to extinction in 17 days, while the other species thrived.

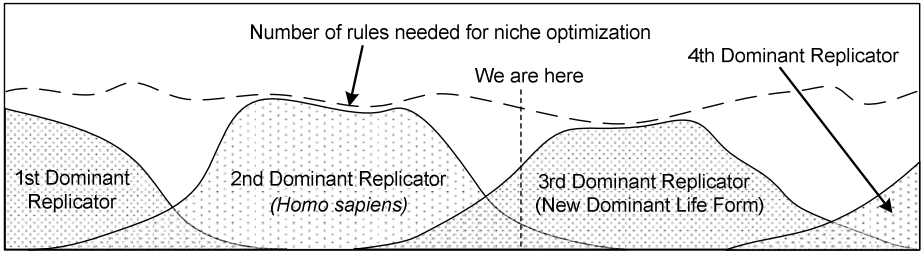
Once *Homo sapiens* ceded control of the biosphere to the New Dominant Life Form an ecological niche succession event occurred. This has happened billions of times before in the genetic world, as one species overcame another in a struggle for survival. It's probably happened trillions of times in the memetic world.

Niche succession occurs when successful competition from one life form drives another life form out of the same niche. This occurs due to superior strategies, superior physical abilities, or both. Sometimes luck is a factor.

The diagram below illustrates the cycle of battles of niche succession. Instead of the way conventional evolution theory usually uses population for the niche limit (carrying capacity) and measure of niche fill, a life form's rule set is used. The wavy

horizontal dashed line is the number of rules needed for niche optimization. The line varies because except in Petri dishes, niches are always changing. The rising and falling curves are the Competitive Advantage Rules of different life forms. The one with the most control of the niche's resources (which includes other life forms in the niche) is the dominant replicator. Except during transition there can be only one dominant replicator in a niche.

The Endless Cycle of Ecological Niche Succession



On the left, the diagram starts with the 1st dominant replicator almost at the limit. At the same time, the dominance of the 2nd dominant replicator starts growing from zero. As it grows, dominance of the 1st replicator falls even further and goes extinct. The 2nd dominant replicator evolves to fill the niche and enjoys exclusive control of the niche for awhile. Then another niche succession event begins, as the 3rd dominant replicator starts to grow. The cycle repeats over and over indefinitely.

Substitute *Homo sapiens* for the 2nd dominant replicator and the New Dominant Life Form for the 3rd one, and you have the niche succession event underway today. Approximately where we are is marked.

The root cause and its impact on the goal of the human system

What is the *source* of why **The Race to the Bottom among Politicians** is dominant? The answer is the root cause of social improper coupling.

Once we've got the right abstractions finding the root cause is easy. Looking at the Dueling Loops model, we see two loops locked in combat. The race to the bottom is promoted by corporate proxies. The race to the top is promoted by humanists, who seek to optimize the common good. The two loops represent how the world's top two life forms, *Corporatis profitis* and *Homo sapiens,* are competing for political system control. This is obvious, as seen in the endless confrontations between public interest activists and corporate interest forces. This is especially obvious in environmental problems.

The Competitive Exclusion Principle says that when two life forms compete in the same niche, one will come to dominant the niche. The other will leave the niche, go extinct, or adapt to a different niche. In the control-of-the-biosphere niche, *Corporatis profitis* has clearly won. It's dominant. The loser, *Homo sapiens* has adapted

to a different niche where he plays the role of good consumer, good employee, and compliant voter. He's happy in this role, because he's under the illusion that he's dominant and in control.

This comforting illusion is part of the mass deception machine run by corporate proxies. This would be a win-win except for one slight catch: the New Dominant Life Form is destroying the system both life forms live in.

Why are these two life forms destructively competing instead of constructively cooperating? *Because of mutually exclusive goals.* That explains everything. If their goals were fully aligned then cooperation on solving problems that benefit the common good would occur routinely. The battle of niche succession would end. The global environmental sustainability problem would be solved immediately because it's such a high priority problem.

Therefore the root cause of social improper coupling is mutually exclusive goals between Corporatis profitis and Homo sapiens. This agrees with the previous chapter, which concluded that:

> The goal of most for-profit corporations is to maximize the net present value of profits. The goal of most people, once past the survival and security stage, is to maximize quality of life for themselves and their descendents. *These goals are mutually exclusive.* As a result, as things get better for the New Dominant Life Form they get worse for the previously dominant life form: *Homo sapiens*.

Because *Corporatis profitis* is the dominant agent in the human system, the goal of that system is to maximize the net present value of profits. If you are a close reader this agrees with economics gospel, such as this extract from *Understanding Capitalism*, a leading typical introductory economics textbook: [120] (p53)

> In a capitalist economic system most goods and services are produced at the direction of employers… who seek to make profits by selling the produced goods and services in markets. Most people in capitalist economies work for someone else (their employers) and receive a wage or salary in return. So work is organized for the purpose of making a profit….

Because work is organized to make a profit, so is culture. So is everything. The whole system is organized to make a profit.

The next paragraph proceeds in this manner:

> To understand capitalism one must find answers to a number of questions. How is work organized? How do markets operate? How much of the output when sold will go to profits, how much to wages, and what will determine the relative magnitudes of these two types of income? Why do some workers get paid more than others? [and more similar questions]

But this line of reasoning takes the reader in the wrong direction. It's a wrong priority. The correct way "to understand capitalism" is the same way any complex social system should initially be analyzed: Who are the system's dominant social agents? What are their goals? How are they going about achieving those goals? What root causes are those goals contributing to? Those are the right priorities.

Why does the above passage veer in the wrong direction? Because like most members of the economics profession, the authors are corporate proxies. They are indoctrinated with their master's goal. That goal is part of their paradigm. They are promoting that goal with everything they do. If they don't they will tend to achieve less than those who do, due to the way *Corporatis profitis* directly and indirectly rewards those who do its bidding and penalizes the rest.

On the page preceding the above passage the authors explicitly paint the goal of the system for the young reader's mind to inhale: (p52, italics are in the original)

> Economics is about *values* (what ought to be) as well as *facts* (what is). It is useful to make values—and their role in any particular economic analysis—explicit. The values adopted in this book are simple: an economy should provide all members of a society with an equal opportunity to lead a flourishing life, and this objective is more likely to be achieved if the economy is *efficient, fair,* and *democratic*.

This paragraph clearly states the goal of an economic system. It's "an equal opportunity to lead a flourishing life." But note how this contradicts the goal presented on the next page, which is employer profit. Very few readers will notice that, however, because of the clever deception used. *They will instead subconsciously conclude that maximizing profits is necessary to achieve a flourishing life.* To do that maximizing growth is required. To do that lots of employers are required. In a mere two pages the reader had been indoctrinated into the universal fallacious paradigm (see page 337) of Corporations Are Good and Growth Is Good.

Others have found the same root cause but expressed it differently. Thomas Kochan, in a paper on *Addressing the crisis in confidence in corporations: Root causes, victims, and strategies for reform*, [121] wrote: (Italics are in the original)

> The place to begin is to correctly identify the root cause of the current corporate scandals. Failure to get this right means that the solutions chosen will be at worse wrong or at best inadequate. My view it that most analysts to date have danced around or avoided identifying the real root cause, namely the *overemphasis American corporations have been forced to give in recent years to maximizing shareholder value without regard for the effects of their actions on other stakeholders*.
>
> ... This view is not yet part of the public or political discourse today. Instead it is easier to focus on personal ethical failures of executives, account-

> ants, and others in the inner circle of power in corporations and financial market institutions. Clearly their have been ethical failures. But simply punishing a few "bad apples," imposing stiffer penalties to deter similar misconduct in the future or imploring executives to be more responsible will fail to get at the conditions that created the incentives for misconduct....

"Instead it is easier to focus on personal ethical failures of executives, accountants, and others in the inner circle of power" refers to the Fundamental Attribution Error (page 270). The error occurs when problem solvers "focus on personal" attributes instead of the systemic factors social agents take their behavioral cues from. Because the root cause of corporate misbehavior arises from mutually exclusive goals, "punishing a few 'bad apples,' imposing stiffer penalties to deter similar misconduct in the future or imploring executives to be more responsible" will not work. These solutions address intermediate causes rather than the root cause.

We have found the root cause of social improper coupling to be mutually exclusive goals between *Corporatis profitis* and *Homo sapiens*. Let's check this against the five requirements for a root cause:

Requirement 1. It is clearly a (or the) major cause of the symptoms.

The symptoms of this subproblem are that large for-profit corporations are dominating political decisions destructively. Mutually exclusive goals between *Corporatis profitis* and *Homo sapiens* are *the* major cause of these symptoms, because if goal alignment existed instead then the symptoms would disappear. This satisfies the first requirement.

Requirement 2. It has no worthwhile deeper cause.

Given the evolutionary algorithm model and the fact that evolution is the ultimate driver of all social behavior, there is no productive deeper root cause of social improper coupling. This satisfies the second requirement.

Requirement 3. It can be resolved.

Because the New Dominant Life Form is an artificial life form its goals can be changed. Looking ahead to solution convergence, we see it's realistically possible to change something as fundamental as the modern for-profit corporation's goals. Thus the root cause can be resolved. This satisfies the third requirement.

Requirement 4. Its resolution will not create other equal or bigger problems. Side effects must be considered.

What equal or bigger problems could solving the environmental sustainability problem create? None are possible, because that's the world's biggest long term problem by far. If it's not solved, no other problem will matter because *Homo sapiens* won't be around anymore. We will have destroyed our ecological niche.

Lack of a suitable niche is the biggest possible problem any life form can have. This satisfies the fourth requirement.

Note how this applies to all four subproblems.

Requirement 5. There is no better root cause. All alternatives have been considered.

These requirement means you've searched the entire root cause space (similar to a solution space or landscape) and have found no better root cause.

The symptoms are that large for-profit corporations dominate political decisions destructively. Why do they dominate, not in terms of why do they succeed, but what is the source of wanting to dominate? There is only one clear answer to that. Social agents exist to achieve their goals. That's all. It's the heart of the source of their behavior. If a social agent is misbehaving consistently, then it can only be because they have the wrong "implicit goal," as explained at length by Peter Senge in the long quote that explains how "the resistance is a response by the system, trying to maintain an implicit system goal" on page 368.

The strongest goal a social agent can have is its built-in permanent goal. For corporations this is currently the wrong goal. Therefore there is no better root cause.

Comments on the root cause conclusion

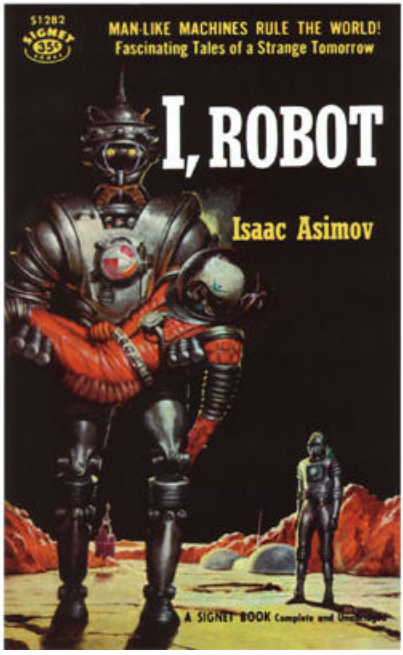
The subtle nature and high complexity of this argument explains why the true root cause of social improper coupling has remained beyond the reach of Classic Activism. The short arms of that process are not up to the task of pursuing the line of investigation leading to conclusions like those in this chapter because Classic Activism is not an analytical process that fits the problem. It's an intuitive, easy to learn, easy to apply, one-size-fits-all process. Despite that crippling handicap, some classic activists have intuitively arrived at the same final conclusion. [122] But because they have no deep analysis to base their conclusions on and prove their correctness, versus hundreds of competing solutions that are just as intuitively appealing, they have been unable to muster the consensus needed to implement the insight. Nor can they see the greater whole required to effectively leverage that insight, so they are stymied.

Although we won't delve into high leverage points and solution convergence until later, we can use the root cause conclusion to peer ahead and begin to ruminate on what must be done.

The root cause conclusion is a potentially important insight because it opens up a fresh new line of attack on solving the sustainability problem. It's basically an artificial-life-form-run-amok problem. This potential outcome has been foreseen by so many creative thinkers that we can turn to them for strategic advice on what to do, and by inference, what not to do. One that comes to mind is Isaac Asimov's and his laws of robotics. These first appeared as three laws in *I, Robot* in 1950. A forth "zeroth law" was later added. :

The **Four Laws of Robotics** are: [123]

0. A robot may not harm humanity, or, by inaction, allow humanity to come to harm.
1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey any orders given to it by human beings, except where such orders would conflict with the First Law.
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.



The intent of these laws was never incorporated into design of the modern for-profit corporation. Given that early decision making error and its now obvious consequences, the conclusion that a certain life form's rule set must be changed is as clear as what Asimov saw in *I, Robot*.

Substep D. Find the feedback loops that should be dominant to resolve the root causes.

The root cause of social improper coupling is mutually exclusive goals between *Corporatis profitis* and *Homo sapiens*. The solution must deal with how to make those goals the same. Thus the system needs a feedback loop to align those two goals. It follows the loop that needs to go dominant is the **Alignment Growth** loop. This loop will be described later when the extended Dueling Loops model is presented.

Substep E. Find the high leverage points to make those loops go dominant.

This substep is just as obvious as the previous one. We can't change the goal of *Homo sapiens* to where it's the same as that of *Corporatis profitis*, because that would only make the sustainability problem worse. Therefore we must change the goal of corporations.

But wait a minute. Is this the highest leverage point possible? Abstracting upward, wouldn't it be even better to align the goal of all artificial life forms with that of *Homo sapiens*? Yes, because we need to consider robots, non-profit corporations, partnerships, governments, states, associations, and so on. We can't foresee what all these will be, so we must include them all. This leads to the high leverage point: correctness of goals for artificial life forms. In other words, we must change the rules of the game so the game favors people rather than the other players as it does now.

Let's test this conclusion. Imagine how easy solving the sustainability problem would suddenly be if the goals of the New Dominant Life Form were changed to align with those of humanity. The energy industry, transportation, the financial industry, agri-business and many more would no longer work *against* solving the problem. They would now work as hard as they could *to solve it*, because optimizing the common good of those people living and their descendents would now be their top goal. Given how well for-profit corporations have done in achieving their past goal, they would do just as well in achieving their new one.

Note how pushing on this high leverage point will resolve the battle of niche succession between the New Dominant Life Form and *Homo sapiens*. The corporate life form suddenly finds himself in the new niche of *the* super servant for humans. That's still a sizeable niche. It should satisfy all but the most deranged and ruthless members of *Corporatis profitis*, who, according to the principle Georgyi Gause discovered, will quickly go extinct.

Analysis of the model drift subproblem

Model drift occurs when a solution model fails to evolve as needed as a social system evolves. Politicians are democracy's problem solvers. They create and manage the solutions for running the world. When they fail to see a solution model (a policy) is drifting and needs fixing before it fails, that is clearly a political decision error. These errors are defects. These defects arise from some form of deeper system failure. These defects are thus where the model drift analysis must start.

Failure to correct failing solutions when they first start failing is the chief symptom of model drift.

Substep A. Find the immediate cause of subproblem symptoms in terms of the system's dominant feedback loops.

Given the symptoms of model drift, what are the loops causing these symptoms? The answer lies in the evolutionary algorithm model back on page 285. For the old dominant life form, *Homo sapiens*, there is no **Intelligent Adaptation** loop. But for the New Dominant Life Form there is. Therefore that loop is the immediate cause of the symptoms. That loop has allowed the modern for-profit corporation to step by incremental step become the dominant life form in the biosphere.

Substep B. Find the intermediate causes, low leverage points, and symptomatic solutions.

The **Intelligent Adaptation** loop doesn't contain the root cause of its dominance. It only contains *intermediate causes*. These are the laws already passed giving corporations advantages over people. Trying to resolve these directly with symptomatic solutions will not work. Yet that's exactly what problem solvers have been trying to do. They've been trying to reverse the decisions in the modern for-profit corporation's favor. This is the same as trying to reach into the Competitive Advantage Rules stock and pull out a rule. That's a *low leverage point.*

There's no way the benefactor of those rules (acting through its billions of corporate proxies) would allow that if it possibly could. This causes insurmountable change resistance when it's tried. For example, Thomas Hartman, writing in *Unequal Protection: The Rise of Corporate Dominance and the Theft of Human Rights*, 2002, documents how corporate dominance occurred. Once you read his book, there will be no denying which life form is dominant, why they are dominant, and how that came to be. Hartman describes the expected change resistance this way: (Page 279-280, italics and comments added)

> When I first shared my concept for this book with a noted—and friendly—constitutional scholar, he replied in an e-mail that he'd had to pick himself up from the floor at *the shock that anybody would seriously propose laws and constitutional amendments to correct the current situation*. [The scholar anticipated high change resistance.] I hope that he has come around to seeing the possibilities, as he and many others—across the political spectrum—now agree that there is a very real crisis in the political, financial, and business structure of the developed world, and that it is rapidly spreading across the world.
>
> As in the story of the Emperor's New Clothes, we've recently discovered we have a problem. The *belief in so-called "free markets"* has reached a near-religious frenzy, particularly in the press, while corporations greenwash and bluewash themselves with advertisements extolling their commitment to nature and community. [A fine example of the power of well

designed, well injected false memes.] But corporations were not created as institutions of environmental preservation or social justice, nor are they true agents of either free markets or democracy. *They are legal devices to accumulate wealth, pure and simple.* [This is why we define the New Dominant Life Form as the modern for-profit corporation and its allies, notably the rich.]

As law professor Lawrence Mitchell noted earlier, "The entire proposition that a corporation is a person is ridiculous." And if they are not people? He says, *"If they are not people we would take them out of the political [decision making] process."*

As Richard Cohen noted in a January 21, 2002 article in the *Washington Post* about the Enron debacle, "What we have here is an updated form of feudalism." [Corporations are the *de facto* masters, and we are their serfs.]

And like the feudal systems that held Europe, Asia, South America, and Japan in their grip for centuries, this new feudalism isn't going to easily submit to transformation or simply morph back into the representative republican democracy from which it emerged and has now largely taken over.

Instead it will fight back, [high change resistance] and if Alexis de Tocqueville was right, *the main tool it will use will be the* media [the most effective channel for injecting false memes into human minds] it owns or has easy access to with its advertising and P. R. dollars, keeping people passively lulled into *the twin beliefs* [false memes] that they are powerless, and that the world's largest corporations do know, after all, how to run the planet and therefore everything is just fine and there's no need to worry about or do anything.

Thus trying to directly change laws controlling the behavior of the New Dominant Life Form is a low leverage point, because a severely disadvantaged *Homo sapiens* is up against Goliath. *Symptomatic solutions* to get the old laws repealed haven't worked in the past. Nor will they work in the future.

Substep C. Find the root causes of why the loops in A are dominant.

Like most immediate cause loops, the **Intelligent Adaptation** loop does not contain the root cause of why it's so strong in terms of how it causes excessive model drift. It only contains intermediate causes. Trying to resolve these directly with symptomatic solutions will not work. We must go deeper to and find out why this loop is so dominant.

A little divergent thinking does the trick. We simply ask ourselves what's happening here from the viewpoint of the best practices of highly effective business management. How do the best of the best management teams think?

Political decision errors are the symptoms of model drift. Repeated errors of any kind are most productively viewed as defects due to immaturity in the process used. In governments this is the political decision making process. If it's producing defects in the form of bad decisions that lead to outcomes like unsustainability, then quality of political decisions must be dangerously low. *Therefore low quality of political decision making is the root cause of excessive model drift.*

Critical thinkers may object that how governments work is so convoluted, involves so many millions of people, and is subject to so much special interest, consensus, and human fallibility pressures that of course the process of political decision making is immature. We're lucky it work's as well as it does. It really can't be improved on all that much. Nations have been trying to do that ever since the fall of Rome.

This is all true except for the claim it can't be improved. Just because we've never done something doesn't mean it can't be done. Just because maturity of the government decision making process has long been low on difficult problems doesn't mean it can't be radically improved. If it realistically can, then this is a resolvable root cause. How it can be resolved is presented later in this chapter. The method used is not that different from the way business has managed its own decision making process for centuries.

We hypothesize that the root cause of excessive model drift is low quality of political decision making. This passes the five requirements for a root cause test: (1) It's clearly *the* major cause of the symptoms, as shown by the model. (2) It has no worthwhile deeper cause because deeper causes, such as poor process improvement, lack of incentive to improve quality, lack of managerial orders to improve quality, etc, are solutions, not causes. (3) It can be resolved, as discussed in the previous paragraph. (4) Its resolution will not create other equal or bigger problems, because the environmental sustainability problem *is* the world's biggest problem by far.

Requirement (5) is "There is no better root cause. All alternatives have been considered." This is a little harder to support but it can be done. Those who have spent a lifetime in business process improvement can instantly see that "low quality of political decision making indicates low quality of a particular process. Here's it's the political decision making process. Once low process maturity has been identified as the problem, there's no need to dig any deeper. Process maturity problems are so widespread and so well understood by those with process training and experience, that digging any deeper is foolish, because a tried-and-true solution exists. *You just improve the process.*

Millions of analysts, managers, engineers, and others have rediscovered this noble truth. I was lucky enough to encounter it in my twenties. I was a sophomore at the Georgia Institute of Technology. I'd already changed majors from Aerospace Engineering to Industrial Psychology, on the theory that if I could understand how people behaved I could understand the whole world better.[124] Then one day I read

that the head of the psychology department of a nearby college, Georgia State, had said that in his experience, one third of patents get better, one third get worse, and the rest have no change. How discouraging. So I pondered what to do. By then I was managing small businesses and succeeding. As a lifelong self-learner, I'd taught myself tons by studying books (especially Peter F. Drucker), magazines (especially Business Week), and the work of others (successful managers). But I felt I still had huge blind spots. So I made an appointment with Professor Rogers, the head of Georgia Tech's Systems Engineering department at the time. I walked into his office and asked him a single question: "Can you tell me what Systems Engineering is all about?" He had a beautiful reply, one I've always remembered: *"Oh, that's easy. We teach you how to take any system and make it run better."* I was sold. That's me. I love improving systems. That all business problems and world problems consist of: systems that are not running as well as they could.

The most important system to an organization is the processes it uses. Unless these are all strong the organization will not be able to achieve its mission consistently and efficiently. *That is the case for the model drift problem*. To the systems engineer skilled in business management and process improvement, the root cause of way too many decision making defects in a large organization is always process immaturity. Therefore there is no better root cause.

Substep D. Find the feedback loops that should be dominant to resolve the root causes.

The root cause of excessive model drift is low quality of political decisions. It follows that for politicians to automatically make high quality decisions the system needs feedback loops causing quality of political decisions to go from low to high. The current loop is the voter feedback loop. However this is so weak it's easily dominated by other loops in the system, such as **The Race to the Bottom among Politicians** and **Intelligent Adaptation** for the New Dominant Life Form. Instead of something as weak as the voter feedback loop, the system needs a *politician feedback loop*. That's the look that needs to go dominant.

Substep E. Find the high leverage points to make those loops go dominant.

Once again, if a root cause is clear then usually so is the high leverage point(s) for resolving it. If we think in terms of processes and defects, each low quality decision is a defects. Thus low quality of political decisions must be primarily due to low *maturity in the decision making process*. That's the *high leverage point*. Raising maturity to a high level will resolve the root cause.

* * *

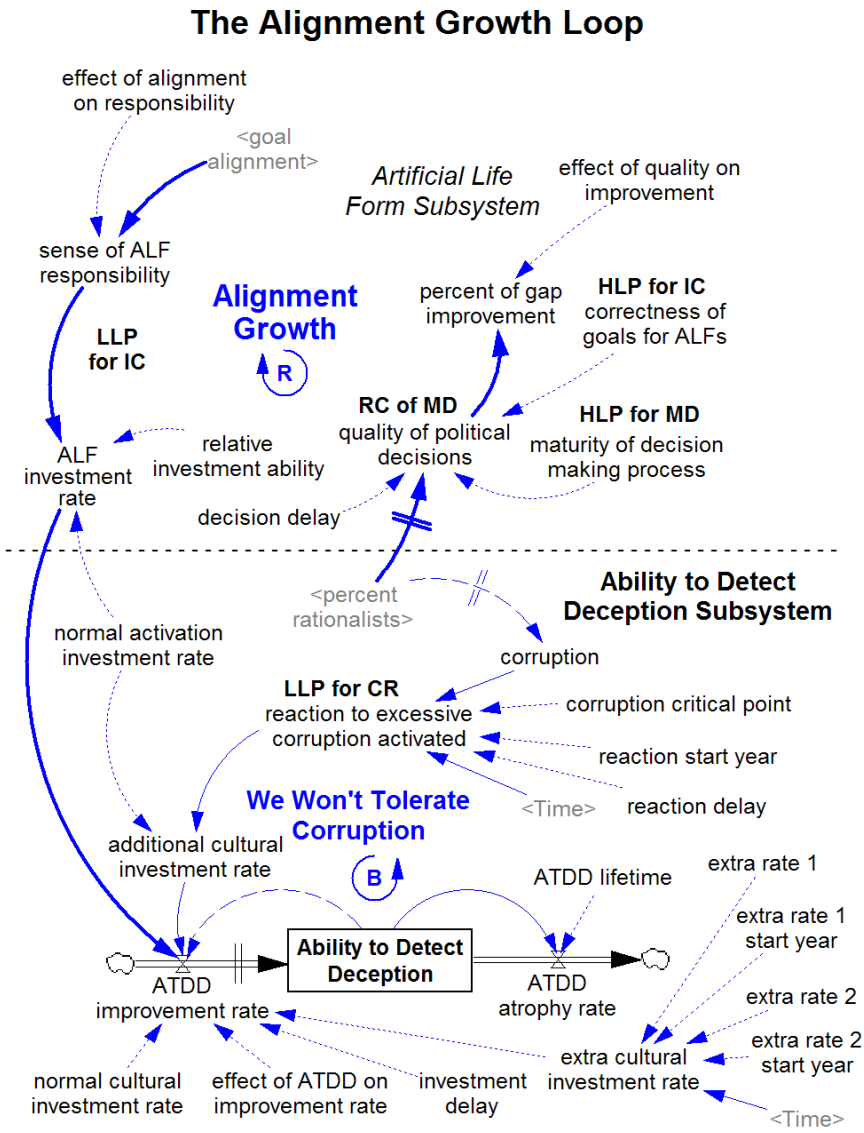
This completes description of the five substeps of analysis on the social proper coupling and model drift subproblems. As the analysis was iteratively performed various models were built. The one that emerged as the simplest explanation of system behavior is presented next.

The Dueling Loops model of the previous chapter has been extended by adding the **Alignment Growth** loop. Supporting this loop are two subsystems. First we show that loop so you can get the big picture. Then we show and explain the two subsystems. Then we return to the loop to explain it.

The model description that follows may be difficult for non-modelers to grasp. Studied closely two or three times, it can be understood. It can also safely be skipped. If you want to do that, skip to the beginning of the simulation runs on page 308.

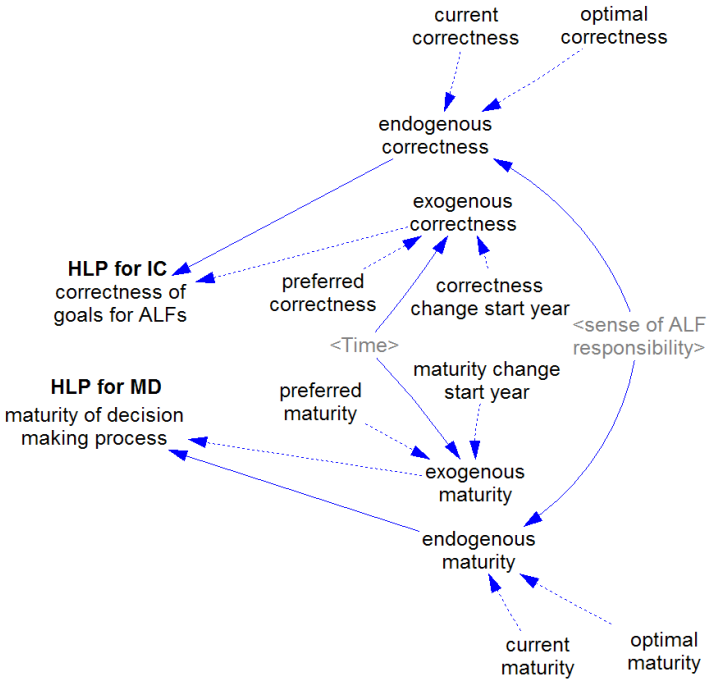
The Alignment Growth loop

The **Alignment Growth** loop is shown below. The root causes and high leverage points (HLPs) are identified. If the model is a reasonable representation of reality, then once we start pushing on the high leverage points with adequate solution elements the system will begin solving its own problem. If this goes as planned, once the system accepts the solution an army of tired activists can step quietly aside. (IC means social improper coupling.)



The endogenous exogenous subsystem

Attached to the **Alignment Growth** loop on the right side is the subsystem below. The subsystem controls the values of the two HLPs.



Endogenous means coming from within a system. The system itself causes a change. Holding all else equal, the more model behavior that's internally generated the better, because the important factors for the model's behavior are included in its feedback loops—as they almost always are in the real world.

But not all model behavior can or should be internally generated. That's why models need at least some externally generated behavior for input. **Exogenous** means coming from outside a system. Exogenous nodes are constants, which includes functions in lookup tables. Arrows coming from them are dotted to indicate they are constant and do not change during a run, unless deliberately changed during a run to support an experiment.

One must be cautious about using too many constants in a model to "get" the desired behavior. Modelers can fool themselves badly by doing this. The model may behave well but for the wrong reasons. The important behavior of a model must emerge endogenously from the structure of its feedback loops, not its constants. However, trying to make too much behavior endogenous can cause just as big a problem, as the model grows too large and complex to clearly comprehend.

On the above subsystem the sense of ALF responsibility, a node copied from the **Alignment Growth** loop, increases goal correctness and process maturity, which in

turn increase the two HLPs. This happens internally, without any outside intervention. This is how systems, including living systems, are self-directed. This node provides the endogenous quality of the subsystem.

The exogenous quality is provided by the eight constants that can be changed from run to run. Of these, two are never changed. They are considered to be the natural unchangeable behavior of the system. These are optimal correctness and optimal maturity. The ones that are varied from run to run are current correctness, preferred correctness, preferred maturity, current maturity, correctness change start year, and maturity change start year.

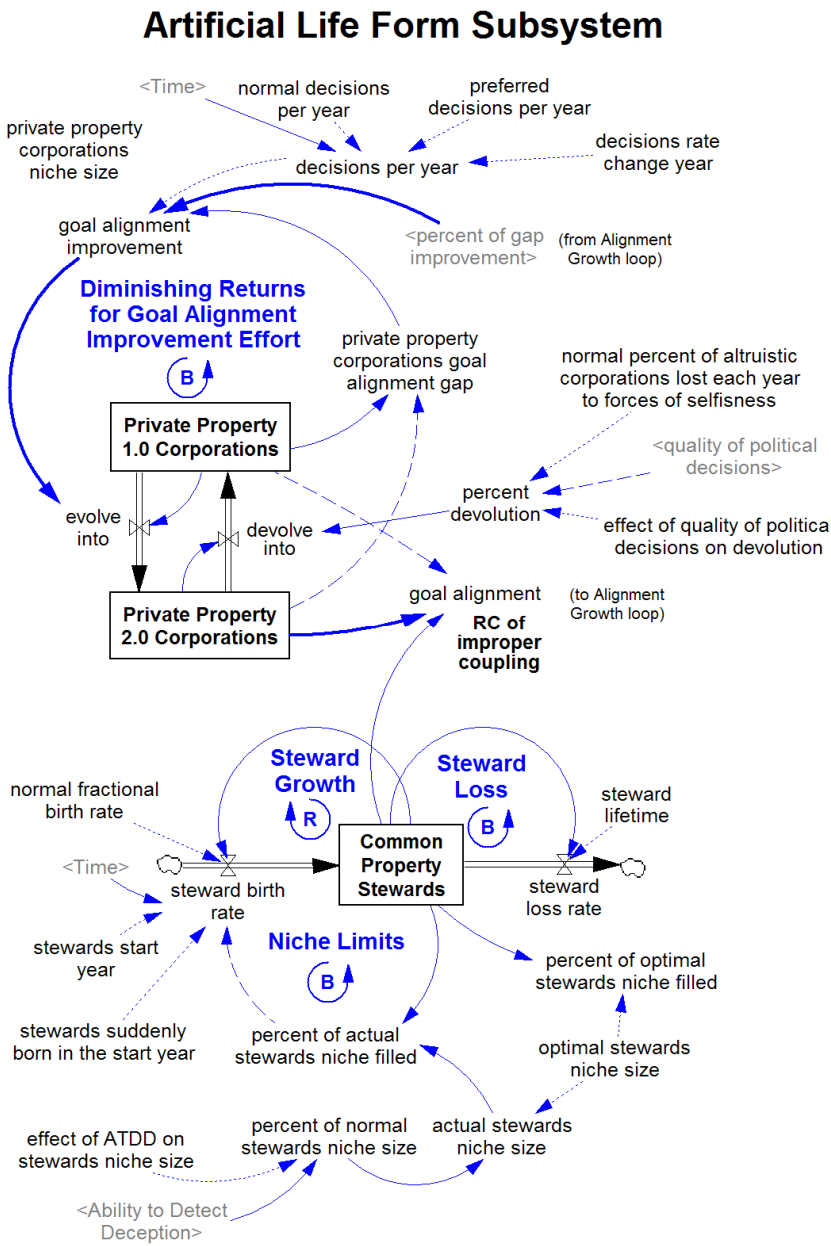
The artificial life form subsystem

On the **Alignment Growth** loop sits a phrase called *Artificial Life Form Subsystem*. It's not shown in that loop, but there's an arrow running from percent of gap improvement to the subsystem, and another arrow coming back from the subsystem to sense of ALF responsibility. The Artificial Life Form (ALF) Subsystem is shown on the next page.

We're about to get ahead of ourselves a little. The model includes some references to stewards and stewardship, which is part of column D and its Common Property Rights solution. This is because the model was created before column D was extracted from column B. The references to stewards support column D pretty well, so rather than remove them and then somehow add a model or a complicated explanation to the analysis of column D, we've left the model unchanged. This gives a simpler overall analysis.

The heavy arrows show the path of the **Alignment Growth** loop through the ALF subsystem. At the bottom, Ability to Detect Deception influences the Common Property Stewards stock. On the right, quality of political decisions affects the rate that 2.0 corporations devolve into 1.0 corporations. Thus all three stocks on the ALF Subsystem are hooked up to the rest of the model.

The purpose of the ALF Subsystem is to model how proper management of three key artificial life forms can cause the **Alignment Growth** loop to grow strong enough to solve the proper coupling problem. Only one of these life forms, 1.0 corporations, exists now. That fact is the root cause of social improper coupling. If we can cause enough Private Property 1.0 Corporations to evolve into Private Property 2.0 Corporations, the social proper coupling problem is solved. Here's how that can be done:



First let's cover the upper loop. **Diminishing Returns for Goal Alignment Improvement Effort** causes initial efforts to improve goal alignment to have a big effect. But later efforts have a smaller and smaller effect, until alignment has grown as high as it's going to be.

The key equation is the one used to calculate goal alignment (GA):

(Stewards + 2.0 Corps) / (Stewards + 1.0 Corps + 2.0 Corps) = GA

Stewardship and 2.0 corporations have goals in full alignment with *Homo sapiens*. 1.0 corporations don't. Thus goal alignment is the percent of corporations whose goals are aligned with people. This is the fundamental concept of the subsystem.

A similar equation is private property corporations goal alignment gap. This is calculated by:

1.0 Corps / (1.0 Corps + 2.0 Corps) = gap

This is the percent of private property corporations whose goals are not aligned with people. Perfect alignment is 100%, so anything less than that is the gap.

Managers think in terms of gaps. The small the gap, the closer they are to a goal. The greater the gap, the more that needs to be invested in closing it. The model captures this investment effort as percent of gap improvement. (This node is explained later.) The higher that is, the higher goal alignment improvement (GAI) is. That node is calculated by:

Gap x percent of gap improvement x decisions per year = GAI

The gap starts at 100%. Suppose percent of gap improvement was 40%. That means that quality of political decisions is so high that decision makers are trying to close 40% of the gap per year. But decisions per year is low. In initial runs it's a meager .1 per year. 100% x 40% x .1 = 4%. This would cause 4% of 1.0 corporations to evolve into 2.0 corporations in one year. That increases the stock of Private Property 2.0 Corporations, which increases goal alignment, which becomes an input to the **Alignment Growth** loop.

Percent devolution (I hope Darwin doesn't mind that term.) has a small but noticeable effect. Normally it's 2%. But as quality of political decisions rises to over 60% in the later runs, percent devolution falls to about ¼ of one percent. That's basically how the **Diminishing Returns** loop works.

The lower part of the ALF Subsystem models the Common Property Stewards stock. This is very straightforward. **Steward Growth** occurs the same way population growth is usually handled. **Steward Loss** is handled differently. In the model, stewards are treated as life forms release into a niche. Because they are given a monopoly on their common properties, they have no competitors. Thus the steward lifetime is infinite. Since our number system has no value for that, a zero is used to indicate infinite lifespan. This causes the steward loss rate to be zero for all runs. Testing shows that a lifespan of 50 to 100 years makes very little difference in model behavior.

The **Niche Limits** loop imposes a limit to the steward birth rate. The optimal stewards niche size is 10,000. But society is so blind to the need for that size that the lower Ability to Detect Deception, the lower the actual stewards niche size.

The stock of stewards starts empty. In the stewards start year the number of stewards suddenly born in the start year is added to the stock. Thereafter no more are exogenously (externally) added. The stock grows endogenously (internally) thereafter. Causing it to grow is the **Steward Growth** reinforcing. loop. Putting on the breaks is the **Niche Limits** balancing loop. Because of the balancing loop the percent of optimal stewards niche filled never reaches 100%, but it comes close. In run 39 it hits 97%. This can be interpreted as 3% of the common property problems needing wise stewardship are not getting it. That's basically how the stewards stock works.

The Artificial Life Form Subsystem is highly simplified. We've tried to include only the most influential components needed for useful behavior. The main lesson is to see that to solve the global environmental sustainability problem, we need to think in terms of what artificial life forms are needed to automatically manage the problem. This is light years from where thinking is today.

Explaining the Alignment Growth loop

The analysis determined that mutually exclusive goals are the root cause of social improper coupling. Resolving this is so essential the entire new loop is conceptually built around a subsystem representing that root cause. This is the Artificial Life Form Subsystem. The subsystem's main input is from the **Alignment Growth** loop and its main output goes back to the loop.

The first thing to learn about the **Alignment Growth** loop is it's a reinforcing loop. This architects the model around the behavior we would most like to see: high alignment. Once that goes high and stays high, the sustainability problem is solved.

Our journey around the loop begins in the center of the model at percent rationalists. This node originates from the left side of the basic Dueling Loops model on page 232. It has been copied here so we can use it in the **Alignment Growth** and **We Won't Tolerate Corruption** loops. Following percent rationalists upward, we see it's used in calculating quality of political decisions. Leaving out the delay for simplicity, this crucial calculation is:

maturity of decision making process x correctness of goals for ALF's
x percent rationalists = quality of political decisions

This employs the same logic used on page 110 where:

process maturity x quality of effort = quality of results

The analogy is that percent rationalists is quality of effort in the second equation. In the model percent rationalists measures quality of effort because the higher percent rationalists is, the better the quality of decision making effort becomes. This occurs because the influence of degenerates on decisions making is lower. Degenerates don't favor good decisions that benefit the common good. They favor decisions that selfishly benefit themselves.

The second equation doesn't contain anything like correctness of goals because it's simplified. It doesn't include what goal a process is trying to achieve. That's not part of a process. It's an external input. Nor is correctness of goals part of quality of effort. A goal is direction of effort. The first equation improves the second equation by adding correctness of goals. To express this clearly, the more complete principle is:

process maturity x quality of effort x correctness of goals
= quality of results

That's the principle the quality of political decisions node uses.

Continuing around the loop, quality of political decisions is used to calculate percent of gap improvement. Here's how this works.

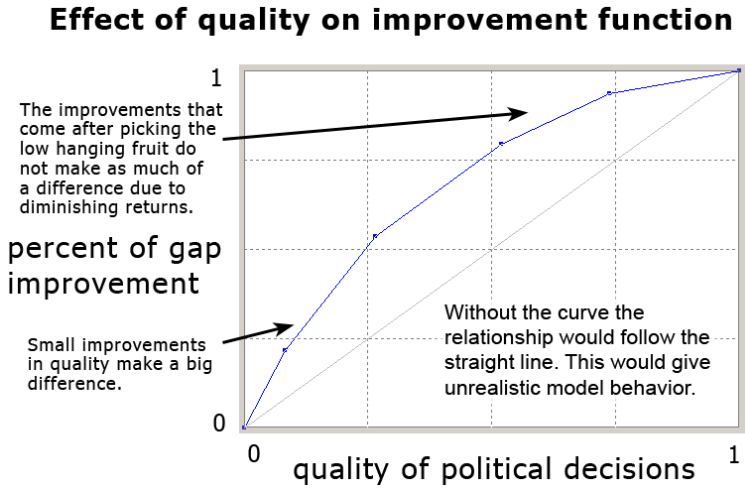
Goal alignment is calculated in the ALF Subsystem. It varies from 0% to 100%. Perfect alignment is 100%. Anything less than 100% is the gap to be closed. The technique of closing the gap prevents goal alignment from exceeding 100%, which is impossible. The technique also allows easy introduction of the effect of diminishing returns, handled in the ALF Subsystem. The smaller the gap, the higher the quality of decisions required to close it.

However, the most important thing the technique of closing the gap does is reflect how people really think and work. We see problems and fix them, and don't worry about what's going well. Problems are symptoms of what needs treatment. Here the gap is the symptoms of a misbehaving artificial life form that need treatment. The gap is what needs fixing. Gaps are usually closed in incremental amounts as solutions evolve. Sometime we can do better, if deep understanding of a problem makes it possible to take big leaps. This is sorely needed here.

The calculation for gap improvement is:

effect of quality on improvement (quality of political decisions)
= percent of gap improvement

The effect of quality on improvement is a function that converts quality of political decisions into percent of gap improvement. This greatly improves model realism by a causing a small quality improvement to make a big difference and larger improvements to not make as big a difference due to diminishing returns. The curve used is shown below. This is an example of the estimates modelers use in qualitative models like this one, until actual behavior can be measured if justified.



Next we encounter the Artificial Life Form (ALF) Subsystem. Percent of gap improvement feeds into the subsystem and goal alignment comes out of it.

Low goal alignment is the systemic root cause of social improper coupling. As solution elements push on the high leverage points to resolve that root cause, goal alignment will rise. This will in turn cause sense of ALF responsibility to rise. This could be called corporate social responsibility, though not every ALF is a corporation. There are also governments, religions, political parties, etc.

Environmental activists have valiantly struggled to solve the sustainability problem by pushing on countless intuitively attractive but low leverage points. Corporate social responsibility is one of them. The location of sense of ALF responsibility in the loop shows why. Pushing on that node *directly* can help some. But it takes an impossibly large amount of force to make that solution work, as the failure of corporate social responsibility (CSR) campaigns and related efforts have demonstrated. But suppose you took the same amount of force and pushed on the high leverage points on the loop. That would lead to an increase in goal alignment, which would then *indirectly* cause sense of ALF responsibility to rise. That rise would be orders of magnitude greater than the insignificant one caused by corporate social responsibility efforts, because nothing affects a life form's behavior nearly as much as its goals. This leads to the principle that *a social agent's goals define its self-interest.*

Adam Smith highlighted the critical importance of self-interest in *The Wealth of Nations* in 1776: (Italics added)

> Give me that which I want, and you shall have this which you want, is the meaning of every such offer; and it is in this manner that *we obtain from one another the far greater part of those good offices which we stand in need of*. It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own *self-interest*. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages.

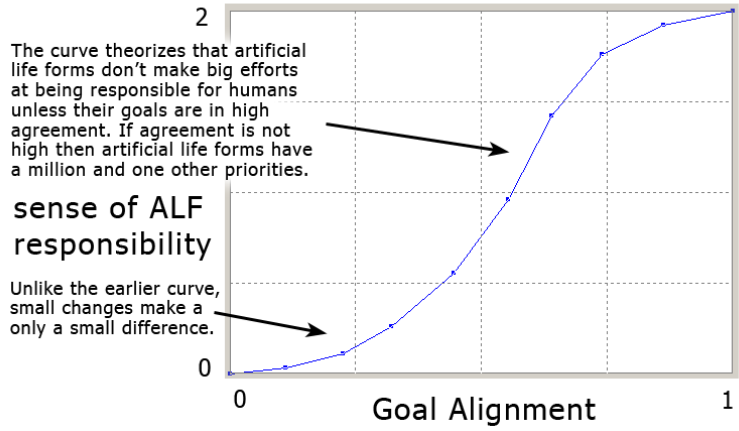
If we can reengineer the New Dominant Life Form to where its self-interest aligns with that of humans, then "we [will] obtain from one another the far greater part of those good offices which we stand in need of."

The value of an artificial life form's self-interest to solve problems whose solution would benefit the common good is approximated by:

effect of alignment on responsibility (goal alignment)
= sense of ALF responsibility

This involves another function. It works the same as the earlier function but uses an S curve instead of a goal seeking curve. How it works is shown.

Effect of alignment on responsibility function



Our journey around the loop now comes to an end. The last node in the **Alignment Growth** loop is the ALF investment rate. This equals:

sense of ALF responsibility x normal activation investment rate
= ALF investment rate

The ALF investment rate is added to the other two investment rates to give the ATDD improvement rate. As this goes up so does Ability to Detect Deception. This is how strengthening the **Alignment Growth** loop solves the problem. It does it by turning on the power of the **We Won't Tolerate Corruption** loop all the time, rather than waiting for the corruption critical point to be activated. This is a fundamental change to the human system.

As explained earlier on page 240, the normal activation investment rate is how much a society starts investing in raising Ability to Detect Deception when a cycle of corruption runs out of control and the corruption critical point is triggered. But that's an intolerably painful way to manage corruption, not to mention focusing on what society should be doing once corruption is out of the way. Much better would be to have a super servant perform these roles. Fortunately one is standing by. It's a little recalcitrant now, but with some retraining it should do a praiseworthy job. Once that servant's goals become aligned with its master, its sense of responsibility grows. That increases how much of the normal activation investment rate job it will take on when needed. In other words, once Goal Alignment goes high, the New Super Servant wants to please its master so strongly that it sees keeping Ability to Detect Deception sufficiently high all the time *as its normal job*. That's what the above formula does.

And it does it better than humans do, because the New Dominant Life Form has so much influence. Notice how in the above graph the vertical axis varies from 0 to 2 rather than from 0 to 1. This theorizes that large corporations, once their goals are aligned with those of humanity, will spend *twice* as much as people to solve the corruption problem. Why not? After all, solving that problem is now their business. Large corporations are not exactly poor.

This completes description of the **Alignment Growth** loop. Because in theory it allows resolving the root causes of social improper coupling and excessive model drift, it's a supremely capable loop. Let's see how it might work in a series of simulation runs. These will also allow further understanding of the model and the analysis substeps.

How the Alignment Growth loop could solve the sustainability problem

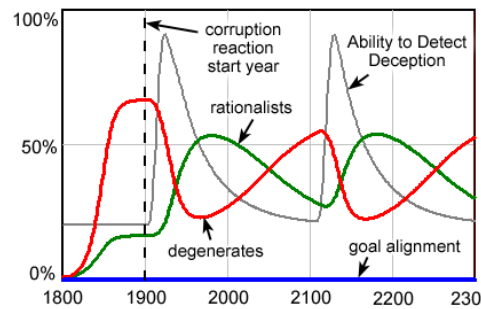
Let's run the Dueling Loops model to see how pushing on various leverage points will affect system behavior. The settings for each simulation run are shown in the table below. Settings that change from previous runs are bolded. In all remaining runs repulsion to corruption equals 20%, and the corruption critical point is 65%.

Run 23 – Earlier on page 242 we presented run 16 as the basic problem to solve. To ensure that by adding the **Alignment Growth** loop we have preserved the behavior we had before, run 23 duplicates the behavior of run 16 exactly. This is done by turning off the **Alignment Growth** loop by setting decisions per year to zero.

Alignment Growth Model Settings	Run 23 is the problem to solve	Simulation Runs							Table 4
	23	24	25	26	27	28	29	30	31
Preferred correctness	NA	NA	NA	**80%**	NA	**80%**	**100%**	**80%**	**NA**
Correctness change start year	2300	2300	2300	**2020**	**2300**	**2020**	2020	2020	**2300**
Preferred maturity	NA	NA	NA	NA	**80%**	80%	**100%**	**80%**	**NA**
Maturity change start year	2300	2300	2300	2300	**2020**	2020	2020	2020	**2300**
Corruption reaction start year	1900	1900	**2010**	2010	2010	2010	2010	**2300**	**2300**
False meme size	2.4	**2**	2	2	2	2	2	2	2
Decisions per year	0	**.1**	.1	.1	.1	.1	.1	.1	.1
Results									
Percent rationalists, cyclic or final	Very cyclic	Very cyclic	Very cyclic	100%	100%	100%	100%	100%	24%
Goal alignment, range or final	0	5% to 8%	5% to 8%	84%	84%	85%	95%	90%	3%
Year alignment reaches 50%	NA	Never	Never	2108	2108	2052	2045	2056	Never
Years to reach 50% from 2010	Never	Never	Never	98	98	42	35	46	Never

To make the graph easier to read the corruption reaction start year is marked. This is the year the ability to detect deception subsystem is turned on. After that, whenever corruption rises above the corruption critical point the reaction to excessive corruption starts.

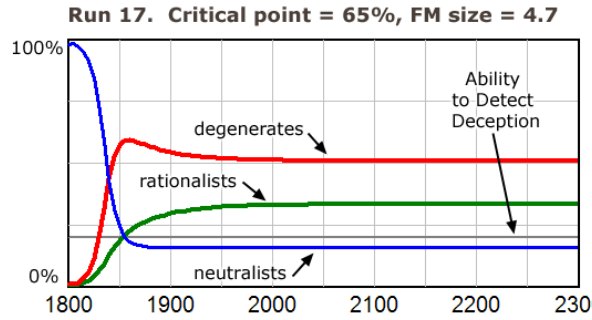
In the run 23 graph the reaction start year is 1900. Corruption equals the number of degenerates divided by degenerates plus rationalists. In 1900 corruption is 80%. Since this exceeds the corruption critical point of 65% a reaction is triggered immediately. As the graph shows, this leads to severe cyclic behavior. The impact of these bouts of extreme corruption would be seen in society's inability to avoid problems such as the unjustified Iraq war of 2003, severe recessions, or environmental collapse. These problems are avoidable if **The Race to the Top among Politicians** is dominant. But when the race to the bottom is dominant instead, rampant use



Run 23. Reference mode, the same as run 16. This is the basic problem to solve.

of political deception leads invariably to large problems like those listed. These are cyclic because their sudden appearance causes people to wake up, solve the problem, see that it was caused by mass deception, and throw the deceivers out in the next elections. As this happens the number of rationalists rises and the number of degenerates falls. But since there's nothing in the system keeping Ability to Detect Deception permanently high, eventually another cycle occurs. And another.

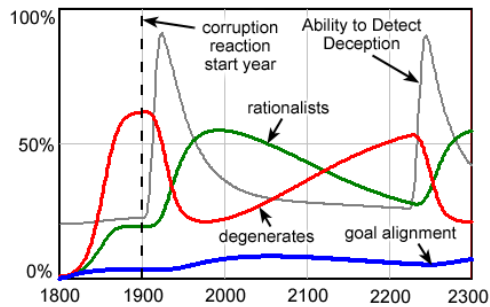
A more sinister scenario occurs when the degenerates figure out what a society's corruption critical point is and keep the symptoms of deception below it somehow. Then a cycle is never triggered. Instead, society degrades through a long spell of corrosive corruption that leave a country or region in social, economic, and/or environmental ruin. This is what happened in run 17.



Runs 18 and later went on to show how society would need a higher corruption critical point to counter the degenerate's strategy of a false meme size of 4.7. So which of these runs represents the problem to solve? History has not been smooth in terms of bouts of mega social problems. Therefore we need to pick a run with strong cyclic behavior. That's why run 16 is a reasonable choice for a rough representation of the problem to solve.

As we continue examining more simulation runs, don't think of the graphs as just curves for numbers in a model. The curves reflect the agony or the joy of living for billions of real people.

Run 24 – In runs 24 and later the **Alignment Growth** loop is on and false meme size equals 2. This size is the degenerate's best strategy given the small changes the **Alignment Growth** loop causes. Run 24 duplicates the behavior of run 23 almost perfectly because the effect of the loop is currently so minor, except for a slightly longer cycle. Here's why:



Run 24. Alignment loop on and false meme size = 2. The results are almost identical to run 23. Now have full Dueling Loops model.

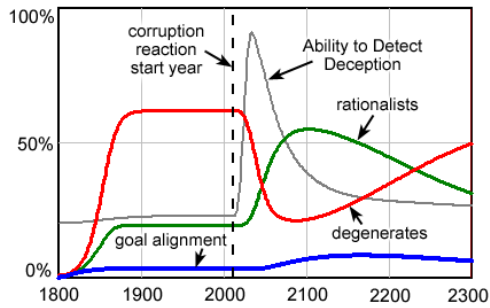
In run 24 current correctness of artificial life form (ALF) goals is 10%. In other words, the goals of the New Dominant Life Form and *Homo sapiens* are almost completely mutually exclusive. Only 10% of their goals agree.

10% is a very rough estimate, but it doesn't have to be exact. It only has to be in the ballpark, because it's the structure of the model that makes the difference in how the system behaves. If the structure is reasonably correct, then ballpark estimates for node values works just fine for our purposes. This is a qualitative model rather than a quantitative model. Its purpose is to strategically understand system behavior, rather than predict exact behavior.

In run 24 current maturity of the political decision making process is 10%. This reflects the abysmal performance we seen in the ability of governments to proactively solve mega social problems. They are terrible at it. What dominates political discourse in most countries is not what really matters in terms of optimizing the common good for all and their descendents, but what matters to the New Dominant Life Form. That life form's goal is to maximize the net present value of profits. So whatever it takes to silently and deceptively achieve that goal is what dominates discourse and thus political decisions.

Now that the Alignment Growth loop is on, the effects of current goal correctness and current process maturity affect goal alignment. This stays very low, bobbing up and down in a range of 5% to 8%. This is too low to have any noticeable affect on the other curves.

Run 25 – In this run the corruption reaction start year is moved from 1900 to 2010, shifting the cyclic behavior to the right.

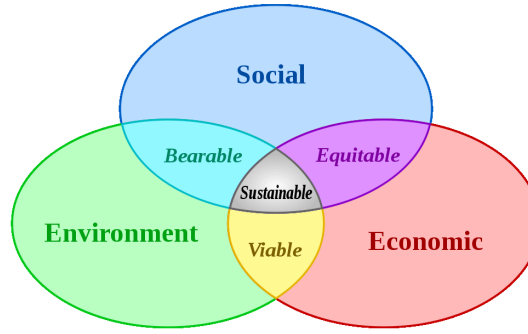


Run 25. The corruption reaction start year is moved from 1900 to 2010. This shifts the reaction to about now for realism.

2010 is about now. The forces of degeneration have been growing. They have recently grown so strong that if a reaction to corruption is going to occur, it should happen now because at least three large wakeup call catastrophe events have occurred lately. Curiously, there's one event for each of the three pillars of sustainability (shown on the next page), which indicates how systemic the effects of degeneration have become. [125]

The **first event** was the totally unjustified Iraq war of 2003. A smokescreen of deception centering on weapons of mass destruction (which were never found and didn't exist, because Iraq had stopped its nuclear, chemical, and biological weapons programs in 1991) and accusations that Saddam Hussein had harbored and supported al-Qaeda (which turned out to be blatantly false). War is a social sustainability problem. A society is socially unsustainable if it cannot avoid wars.

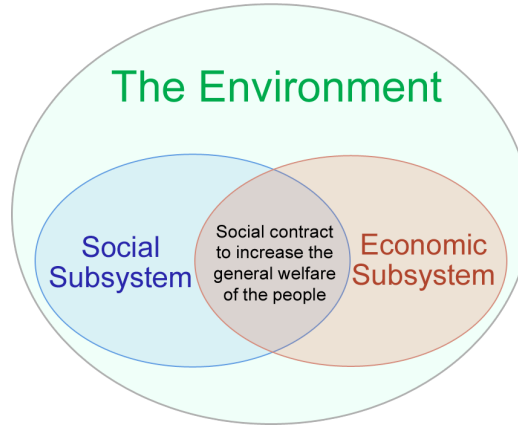
The **second event** was the ominous news in 2008 that carbon emissions were rising much faster than the IPCC's (Intergovernmental Panel on Climate Change) models had predicted. The difference was alarming: "The growth rate of [fossil fuel] emissions was 3.5% per year for 2000-2007, an almost four fold increase from 0.9% per year in 1990-1999. … This makes current trends in emissions higher than the worst case IPCC-SRES scenario." [126] A four fold increase is clear, shocking evidence it's time for society to wake up and do something. Emissions growth is an environmental sustainability problem.



The three pillars of sustainability are a popular, simplified way to envision complete sustainability. When a society has all three pillars it is fully sustainable. The diagram illustrates how the three pillars work together.

The **third event** began in 2007 with collapse of a global housing bubble. This, combined with overshoot in consumer credit, overinvestment in high risk new financial instruments, and dangerously low banking capital-to-asset ratios, led to widespread bank insolvency. This triggered a recession in late 2008 that grew so large it has rivaled the Great Depression in magnitude. Recessions are an economic sustainability problem.

These three events are so large that they, and others like them due to the same underlying reasons, should be causing a corruption reaction about now. That's why the corruption reaction start year is 2010.

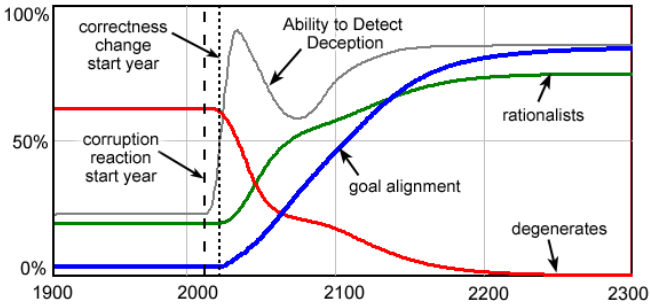


The two subsystems of the environment – This "ecosystem health" perspective shows why environmental sustainability must have the highest priority of the three main types of sustainability. The maximum health of the two subsystems is determined by the health of the greater subsystem they lie within. Thus social problems like poverty and disparity of wealth and economic problems like level of GDP must always take a back seat to environmental sustainability.

Run 26 – From this point forward, the graph starts at 1900 instead of 1800. There's no need to show the simulation coming to equilibrium. It's distracting and adds little to the story these graphs can tell.

In this run we begin to turn on the full force of the **Alignment Growth** loop. The preferred correctness of goal alignment is set to 80% and the correctness change start year moves from 2300 (which means it never happens) to 2020 (so it will happen then). This is ten years after the reaction to corruption begins. It will take about that long for problem solvers to get solution elements in place to begin pushing on the high leverage point of correctness of goals for ALFs.

Pushing on a high leverage point is so effective it always causes dramatic change in a system's behavior. As the graph shows, the cyclic behavior has vanished. Goal alignment soars to 84%. The number of rationalists rises to a high level. Best of all, the degenerates go extinct. They are wiped out. Overall, this is a tremendous improvement.



Run 26. The correctness change start year moves from 2300 to 2020. The cyclic behavior disappears and goal alignment soars to 84%.

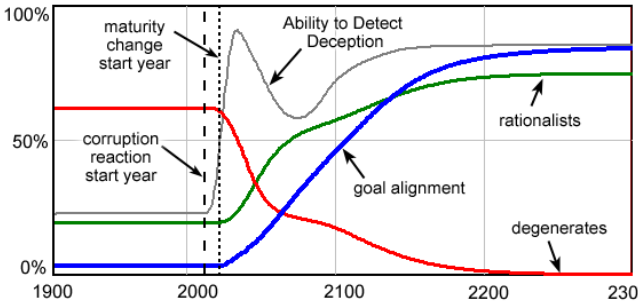
But it's not enough. Look how long it took for goal alignment to reach 50%: 98 years. It will take at least 50% alignment for the New Dominant Life Form to drop its change resistance and start actively helping humans to solve the sustainability problem. Since we need a tangible measure of when the model can "solve" the problem, let's say that occurs when alignment reaches 50%. (Later this measure will be when percent of optimal stewards niche filled reaches 50%.)

Here's why the rationalists curve reaches about 75% on the graph but percent rationalists reaches 100% in the table of simulation runs. Percent rationalists = rationalist / (rationalists + degenerates). The rationalists curve is the number of rationalists, rather than percent rationalists. The same holds for the degenerates. At the end of the run there are about 75 rationalists, 25 neutralists, and no degenerates.

As big an improvement as it is, run 26 is not good enough. How can we do better?

Run 27 – Run 26 changed goal correctness. This is one of the two identified high leverage points in the **Alignment Growth** loop. So what happens if we change process maturity instead? Will that work any better?

No. It works exactly the same. This is due to the formula used to calculate quality of political decisions, as explained earlier on page 304. The correctness of goals for ALFs and maturity of decision making process nodes affect the calculation equally, as seen in the equation used:

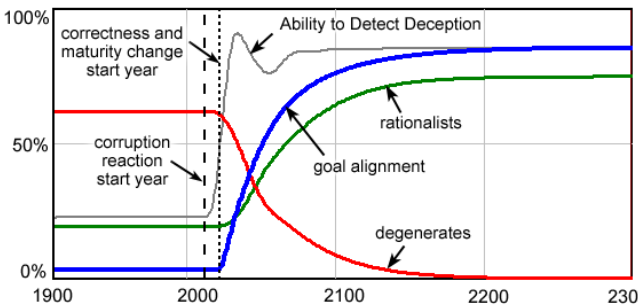


Run 27. In 2020 the process maturity changes instead of goal correctness. Dynamic behavior is identical.

maturity of decision making process x correctness of goals for ALF's
x percent rationalists = quality of political decisions

Thus changing each node separately has the same effect. This raises the obvious question: What happens if we raise both to 80% in 2020?

Run 28 – We have marvelous results at last. Instead of goal alignment reaching 50% in 2108, it reaches it in 2052. This is only 32 years after changing goal correctness and process maturity in 2020. Final goal alignment inches up a little more, from 84% to 85%.



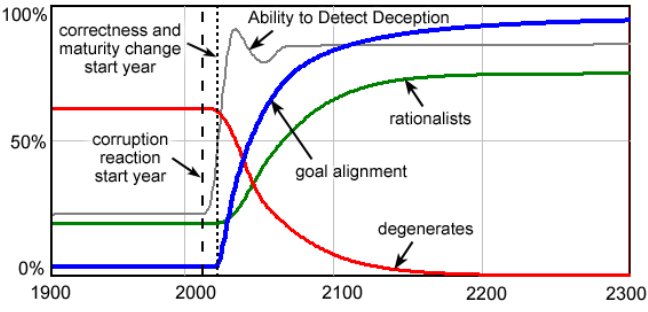
Run 28. Goal correctness and process maturity both change from 10% to 80% in 2020. Great results.

Now the model is starting to pay off. We can see what points in the system we should be pushing on to get the behavior we want.

These are super curves, *if* we can achieve them. Because we understand the structure of the problem we have become system puppet masters. We push, and the system responds as anticipated.

Run 29 – Can we do better if we raise goal correctness and process maturity from 80% to 100%? These are such fantastic high leverage points it could help tremendously.

Experimentation shows the answer is we can indeed do better. Instead of goal alignment topping out at 85% it hits 95%. And it passes the 50% level 7 years earlier in 2045. This is great results.



Run 29. Goal correctness and process maturity change to 100% in 2020. This is even better.

Unfortunately, this run is a sham. It's unrealistic. It's not going to happen. 100% for these two points is unrealistically high. Perfection like that will not occur for hundreds of years. Sophisticated artificial life forms are so new, and so obviously hard to control, that we will be lucky enough to reach the 85% goal alignment of the previous run. So let's be content with run 28. It's the best we can realistically do.

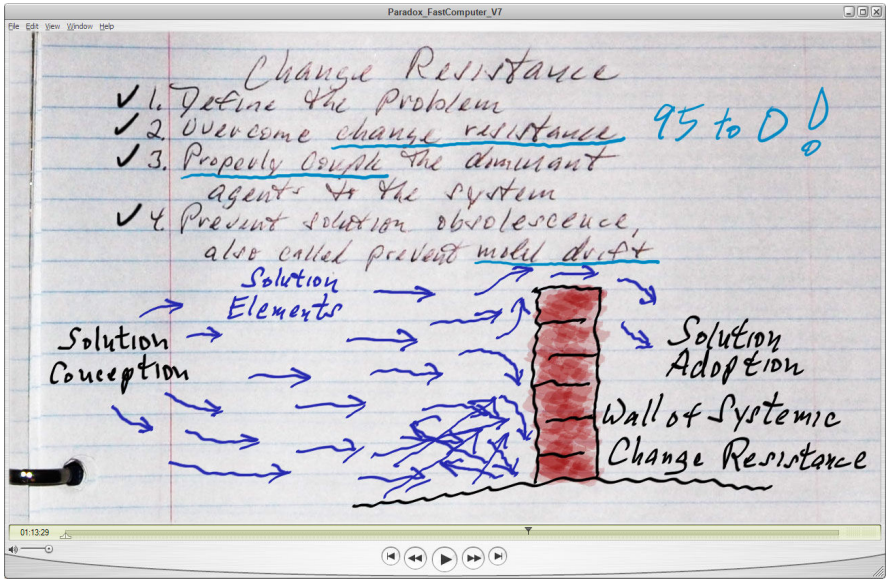
Experimentation shows setting both points to 90% gives 90% goal alignment and crosses the 50% level in 2048. Even 90% is unrealistically high for what we, as humans, can design. But perhaps we can find someone besides humans to design goal correctness and process maturity for us….

The invisible brick wall of systemic change resistance

We have alarming news. There comes a time when the truth must be told. However much sustainability advocates, myself included, would like to believe they can solve the problem this way, they can't. Even deep structural and well decomposed analyses like the one presented here so far cannot penetrate the brick wall of change resistance as sketched on the next page. [127] The wall is so high and so thick that run 28 can't be done. It's a pipe dream. It's simply not going to happen, until we perform steps 1 and 2.

Here's the proof pushing on the high leverage points of correctness of goals for ALFs and maturity of decision making process won't work:

Simulation runs 24 to 29 all assume that a reaction to corruption is going to occur sometime soon. But it hasn't. The three events discussed earlier on page 311 were each so large and damaging that they should have knocked enough people into their senses to wakeup and spontaneously start a reaction to corruption. But nothing happened beyond a few more progressive politicians getting elected.

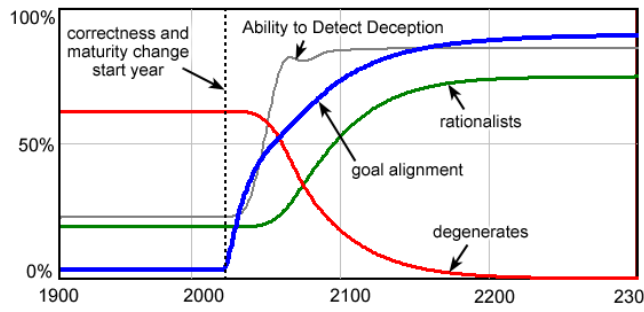


Graphic portrayal of how the process of Classic Activism causes solution elements to flow from conception to adoption. In theory it should work on problems whose solution would benefit the common good. But in practice there's an invisible brick wall (here made visible) that causes most solutions to bounce off the wall and fall to the ground, unadopted. There they pile up and accumulate, as does the growing frustration of classic activists. The frame occurs 73 minutes into *Cracking the Mystery of the Progressive Paradox*.

A natural experiment has been run. We can see the inputs. These were the three mega-wakeup call events. We can see the outputs. Little changed. That's how resistant the system is to change. *No natural reaction to corruption is going to occur about now.*

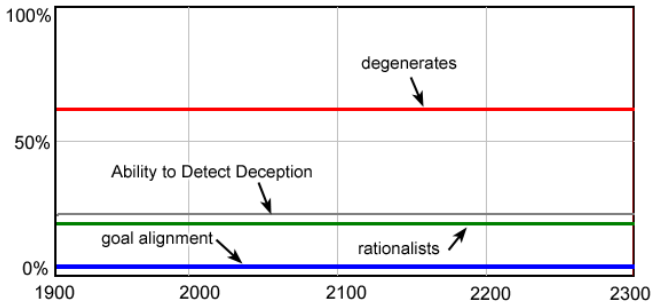
That realization means we need to run the model again, without the corruption reaction spontaneously occurring. Here are the results:

Run 30 – The results still look excellent. But looks can be deceiving. There's nothing in the model *causing the system to allow pushing* on the high leverage points of artificial life form goal correctness and process maturity. Nor have we discussed anything that would do that,



Run 30. As in run 28, goal correctness and process maturity both change from 10% to 80% in 2020. The corruption reaction start year is moved to 2300, so the corruption reaction is never triggered. The graph says the problem is solved, but this is unrealistic.

other than activists magically pushing on those points and getting fantastic results. The graph is like a stage magician floating a lady in the air. We know there must be something holding the lady up, even though we can't see it. So what's holding up that stunning goal alignment curve? Nothing at all. It should never have floated up from the low level it was at in run 30. The curve should come crashing back down to the floor of reality. It should look like this:



Run 31. Goal correctness or process maturity cannot be changed now, due to high change resistance. For as far as the eye can see, the system will remain locked into its present pattern of high degeneration and low rationalism. Unless….

Run 31 – In this run the corruption reaction never starts, because the real system did not react to the three wakeup call events. This causes change resistance to remain so high that the system will reject any attempts to raise preferred correctness of artificial life form goals or preferred maturity of the political decision making process. So in this run those two changes are never made.

The result is all four curves are dead flat, as billions of people will be unless the sustainability problem is solved proactively. Yes, there will be blips of sanity and thus more rationalists (or even more insanity and more degenerates, due to desperation and conflict) as wakeup call catastrophes too huge to ignore appear. But by then it will be too late.

Therefore civilization is stuck. Unless we can find a way through this impasse, the cliff of environmental collapse lies dead ahead. This seems such a shame, because little *Homo sapiens* has come so far in only 200,000 years. Unlike the dinosaurs, whose existence came to an abrupt end due to an event they had no control over (a massive asteroid or comet striking the Earth), humans seem destined to perish by their own hand.

What's the simplest possible way out of this desperate situation?