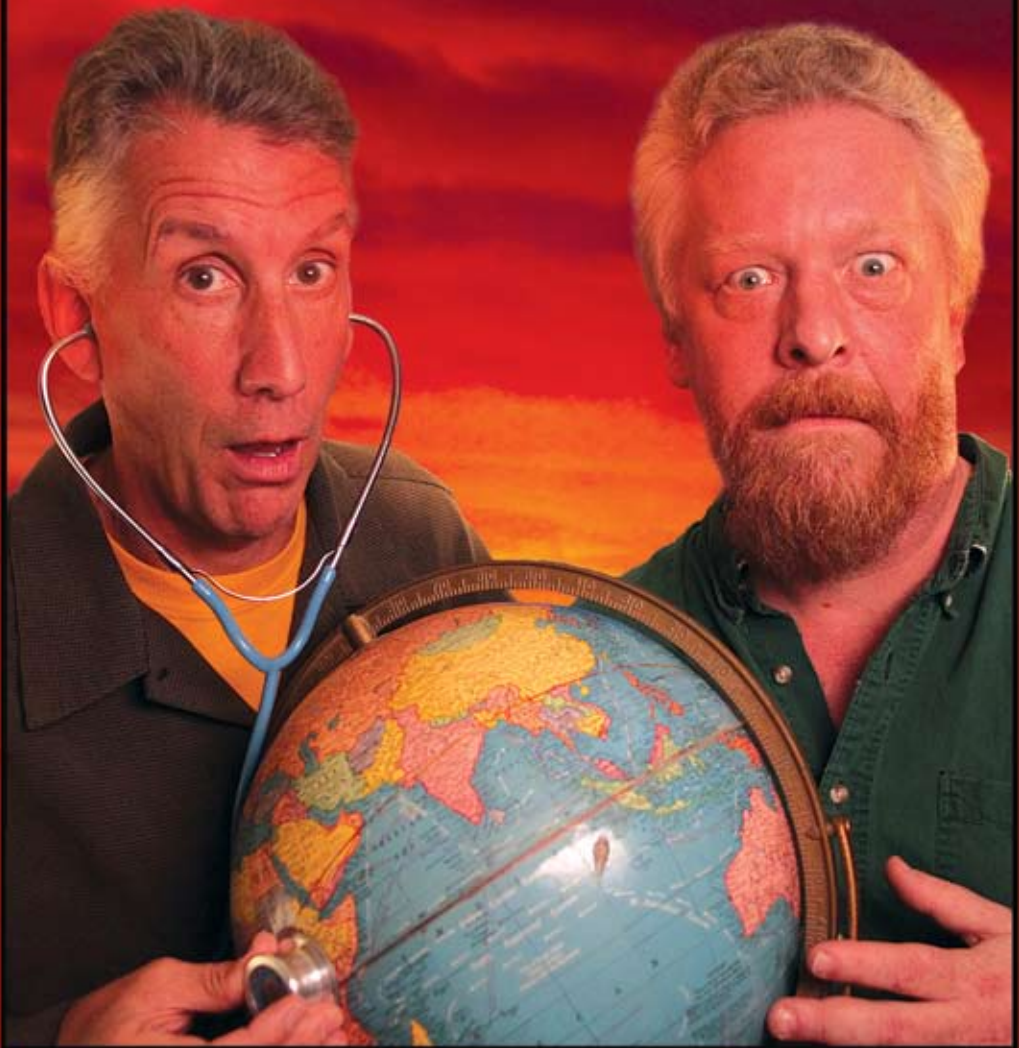


HUMORING the HORROR OF the converging emergencies

Climate Chaos! Biology Breach! Species Collapse!
Infectious Disease! Resource Depletion!
And... *Recovery?*

The ApocaDoes



THIS SMALL BOOK...

is intended to be a fast, funny and frightening read, about things that matter. Sometimes we'll get a little, well, science-y. Sometimes we'll get a little silly, a little pedantic, a little too passionate, or too poetic....

But we guarantee that if you read it, you'll think about our world differently.

'Doc Jim (Indianapolis, Indiana), and

'Doc Michael (Scotsburn, Nova Scotia, and Annapolis, Maryland)

May 11, 2010

*For more information on the ApocaDocs, or the stories referenced herein,
please visit www.apocadocs.com, or email apocadocs@gmail.com.*

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HUMORING the HORROR **of the converging emergencies**

PROLOGUE

(Setting: The ApocDocs Clinic. 'Docs Michael and Jim greet Earth at the door.)

Hello, Earth. Good to see you. Make yourself comfortable. Roll up onto the table there. Shall we help you? Yes, that white paper isn't terribly comfortable, is it? Kind of crinkly and stiff?

Earth, we won't beat around the bush. We called you in today because every year, for as long as we humans have been doing the analysis, you've gotten the same diagnosis -- you know the one: "Never-Ending Health." Well, Earth, we've been reviewing your charts, and revisiting a few things with, um, modern technology. It seems that earlier diagnosticians missed a few indicators.

We need to talk.

We were all under the impression, you see, that your immune system would handle anything that came along. But -- whoops! -- turns out we were wrong. We have to be straight with you, Earth. Recent analysis of your records indicate that you've got some... well, some serious... even life-threatening conditions. Your atmosphere has become destabilized, your oceans are in decline and clotted with plastic, we're seeing metastatic growth of some species and the extinction of others, a disrupted thermo-metabolism, and severe organ collapse: lungs, liver, kidneys. There may be no hope.

Thank goodness we caught it so soon!



Introduction

We're Jim and Michael, the ApocaDocs.

The truth is, dear reader, that 'Doc Michael and 'Doc Jim are not really doctors! We do, however, play "doctors of the Apocalypse" on a Web site!

We don't mean The Apocalypse, as in "Revelations" -- er, or not that kind of "revelation." We mean it in a much more secular sense. In the "this death spiral we've called upon ourselves" kind of apocalypse. In the "is this a suicidal society" kind of apocalypse. The "boy are we up shit's creek paddlessly" kind of apocalypse.

An "OMG our habitat is collapsing" kind of apocalypse.

How do we "doctor" this? As we said, we are faux doctors -- and we believe laughter is, as they say, the best medicine.

We're not specialists. We're not even scientists. Perhaps we're the general practitioners of environmental collapse -- or maybe the broad diagnosticians of the converging emergencies.

For years, we've intensively tracked the effects of species collapse, biology breach, climate change, resource depletion, infectious disease, and much more...

We've pored over thousands of articles on hoards of issues -- most cast as the single most extraordinary and significant threat to humanity ever. We've read, posted and be-quipped them all...

Now all we can do is laugh, and hope to help you do so too.

We have to laugh. Because... well it IS

Or perhaps
"The
Tricksters
of the Great
Unraveling"



Unless tears
are a more
appropriate
response.

pretty funny, in a morbid, macabre, surreal, Borgesian sort of way: Humans, via unchecked, mindless, unceasing growth, consumption, and development, have come to the brink of destroying our own habitat -- in the course of just a few generations!

Yeah, it's that serious. We know -- we wrote a book about it!

So we 'Docs are here to help. To give you that spoonful of sugar for the horrifying medicine of the truth, regarding what we have wrought for ourselves. We know how difficult this will be to read. In parts you'll want to shriek in horror, or rage with grief, or say "pshaw, 'tain't so bad." For us two 'Docs, it's been all of that and more. We've been carried through the traditional stages of grief ourselves.

Here's a glimpse of how it went:

The Five Stages of Grief

DENIAL

Alas, our entire species is in denial. But before we go there (or avoid going there), we want to let you know that we, too, were in denial. Or at least, in retrospect, it seems that way. Those were heady, salad-days times when we weren't fretting daily about some new bit of terrible, holy-shit news. Back then we were caught up with our non-doc lives, raising our children, working our jobs, traveling and playing and generally having it pretty good. We knew some bad stuff was going on, but what's to worry? Nature recuperates.

That
hammer
hitting my
head is *just*
a theory.



ANGER



Hey!
Humans!
*God damn
you all!*

We were pissed. Al Gore's *Inconvenient Truth* made us livid -- because it was only part of the story. We tried to make up words for what was happening: planeticide, earthicide, terracide. We began to be haters. We hated people who believed in Intelligent Design, Hummer drivers, James Inhofe and his supporters, the GOP in general... the list went on and on. Anger. Anger at ourselves

as well, for driving instead of walking, flying instead of driving, for running toasters and microwaves and leaving the thermostat up. For throwing tons of shit away that could have been recycled, for buying new crap shipped from China in boats carrying bilgewater bulging with invasive species.

Eventually the anger filled us up and made us sick. But at least that had the clarifying effect of leading us to:

BARGAINING

Okay, so can't we just work this out? Can't we just all get it together and start making changes in our behavior? Start carpooling and recycling and gardening... and before you know it, we could turn this puppy around! Nature is very forgiving, after all. But... India and China started coming on strong, building a coal-fired plant every, what, coupla days or so? Maybe if I give money to Greenpeace and World Wildlife Fund and Obama, they'll protect the species, and the rainforests, and transform the economy. But species are collapsing, and we're using up rainforests like tissue paper, and the status is very quo. But maybe, if I just use less tissue paper, and start a website....

I use
compact
flourescents!
I'm helping
protect the
planet!



Then the pivotal, seminal, fulcrumal, heart-wrenching event, the circumnavigable North Pole in late summer 2008. For the first time in 125,000 years, the Northwest and Northeast Passages were open. It became clear to us that climate change was happening way too fast and the world was way too big with way too many selfish people and way too many ppm of CO2 and ppb of PCBs and too many dead zones and plastic gyres and albatrosses force-feeding plastic to their young to do anything but fall into utter and complete:

DEPRESSION

Wake me
when the
world ends.



What's the point. We could stop eating meat until the cows come home, ride our bikes every day, replace every old lightbulb, and it wouldn't amount to anything meaningful on a planet of almost 7 billion people, a planet (sorry, Earth!) run by the profit motive, immediate gratification, self-interest and multi-national corporations.

This bum-out stage could have gone on and on for a long time... but after awhile we started to notice that our wives were getting tired of us. Our kids no longer thought we were cool. Our friends stopped wanting to hang around with us. Most importantly, we stopped getting invited to parties and swanky social events, because we were just so dang depressing to be around. And so...we had our dark-night-of-the-soul-search-comeuppance and decided we didn't have the, well, time to sink into the morass.

ACCEPTANCE

Normally, in the whole Kubler-Ross schema, this is the stage where you accept your fate. Well, we aren't there, because we still think there's a chance. What we've done in this stage is accept that there is a point to trying, if for no other reason than to engage as fully as possible in what is most certainly the beginning of the Great Unraveling. The Beginning of the Bad Times. The Ecollapse.

We're not
morassholes.

All right, so this is not the most inspiring of "acceptance speeches," but we were straight with the Earth when it came to our clinic, and we'll be straight with you.

We don't know if we can pull this off -- "we" being humans and "this" being the crazy possibility we DON'T despoil ourselves to death -- but we can't seem to figure out what other option there might be.

Giving up doesn't seem to be in the cards -- in our cards at least. And while we yearn to party like it was 1999, our consciences won't let us turn away from the horror.

So our Kubler-Ross stage of Acceptance is accepting that we're committed.

Committed to watching and recording and assessing and quipping and grappling with news of what we're doing to ourselves. For our entertainment, as well as yours.

Dear Reader, please step with us through some apocalyptic, um, "revelations." We start slowly, and then build to something of a climax. It isn't pretty, but it's kinda necessary. Let's start with the fundamentals of life -- the other co-inhabitants of the earth.

Because a planet is a terrible thing to waste.



3. SPECIES COLLAPSE

'Docs: Hello and welcome to our office, creature. Please make yourself, um, comfortable. Sure, just flop up onto the table there.

Baiji: Thank you, doctors.

'Docs: Tell us why you're here.

Baiji: I'm the last of the Yangtze River dolphins -- known as baiji -- a freshwater species that only inhabits certain river systems in eastern China.

'Docs: You say you're the last of your kind?

Baiji: 'Fraid so.

'Docs: Literally? How sad.

Baiji: You have no idea. We've been recognized as a one of the rarest, most threatened mammal species for some time. According to you humans, one of the last baiji ever seen was spotted in 2001 -- a pregnant female. (pause) That was my mother.

'Docs: We're so sorry.

Baiji: As you should be. You and all your kind. From habitat destruction like dams, to collisions with boats, to overfishing -- and not even intentional overfishing! -- we've been drummed out of existence altogether.

'Docs (checking our chart): Fishermen in your part of the world use rolling hooks, nets and electro-fishing tactics.

Baiji: (shudders) The rolling hooks are the worst.

'Docs: They've been banned.

Baiji: Tell that to my fellow baiji. Er, that is, if there were any.

First the wasps go.
Then the bees go.
Then the birds go.
Then the other insects
go wild.

'Docs (flipping to next chart): Shattering, Baiji. This represents the first global extinction of a large vertebrate in over 50 years. And, according to our records, only the fourth disappearance of an entire mammal family since AD 1500.

Baiji: And we are the first ever cetacean species to be driven to extinction by human activity.

(pause)

'Docs: Is there nothing to be done?

Baiji: When I go, the species is gone. As one of your famous human writers would say, "So it goes."

SO IT GOES, INDEED. The great Kurt Vonnegut once said that humans are a virus "the Earth's immune system is trying to get rid of..."

If only we evolved as fast as viruses do!

As a virus, we humans have put extraordinary pressures upon the ecosystems of the earth, from destroying land through deforestation and development, to polluting the air, soil and water with toxins. Flora and fauna, all subject to our clumsy, grubby, mindless fingertips.

The double trouble is, we're a not just virus-like, we're a species, too.

Humans are currently causing what biologists call "the sixth extinction." Sixth, because over the last 540 million years, there have been five giant mass extinctions. Usually these are caused by some shift in oceans or atmosphere, by a humungous volcano belching outrageous amounts of smoke into the atmosphere, or by a meteor the size of Manhattan steaming up the place.

What's a couple more of our surplus species? Y'know, we own millions of 'em.



Recently, we humans have been noticing some changes in our fellow inhabitants. Each year, the International Union for the Conservation of Nature comes out with its "Red List" of endangered and threatened species. The numbers from 2009 were chilling:

70% of plants, 35% of invertebrates, 37% of freshwater fish, 30% of amphibians, 28% of reptiles and 12% of birds are “threatened.”

And mammals? One in five face the threat of extinction.

Some people say it’s just “natural variation,” and that humans are not at fault. It’s just a remarkable coincidence that this extinction event has been happening over the last 10,000 years, the years that humans became the masters of this earthly domain.

Remarkable coincidence indeed: 10,000 years, from the 540,000,000 years that life has existed, represents a 1 in 54,000 likelihood of chance. Getting struck by lightning: 1 in 20,000.

Alas, it’s not about chronological coincidences. It’s about alternate alliteratives: how we’re causing, contributing to, or catalyzing the collapse of creation.

Sufferin’ saprogenic
succotash!

While we’re not “responsible for” the stunning collapse of amphibians (who have been around lots longer than mammals), we’ve turned the surface of their world into our playpen/garbage dump, misting it with chemicals that frogs have never experienced, and which are absorbed through their delicate skin. The chitrid fungus, and myriad alien species, is being carried from hither to thither on the soles of globetrotting ecotourists, and in the bilgewater ballast of giant ships.

So, okay, maybe we are kind of “responsible for” the amphibian collapse.

But surely we’re not directly “responsible for” the stunning collapse of bats in the Northeast, called “white nose syndrome.” Starting in January and February of 2007, specialists began noticing that bats were flying out of their caves in January and February, into the winter snow.

Their
inaudible
SOS:
EEK-EEK-
EEK
ek-ek-ek
EEK-EEK-
EEK.



They were waking from hibernation emaciated – starving and dehydrated, looking like little voodoo bags of bones, stones and string. And they died in droves, flying out into freezing temperatures where there was no food

source, and no running water. First it was only in the far Northeast, but by winter 2008 the scourge had moved to Pennsylvania; by 2009, into Virginia. The death rate among affected Hibernia is in the 90% range -- bat caves with 10,000 bats dropping to 1000, or fewer. As if every right-handed human in every city died a gruesome death.

That can't be our fault, can it? It's a fungus, right?

Bats have also been around far longer than humans. They always congregate in huge numbers, and travel in semi-migratory patterns, so if there was a fatal white-nose fungus around North America, it likely would have spread from bat-towns to bat-cities like a plague long ago.

So why now? Perhaps it's because Europeans brought a variant of White Nose Syndrome on their caving boots, or spread it in the little hibernation blankets they distributed to the bats – or neither. Perhaps it's a coincidence that it is happening during this particular set of human-intensive decades within the millions of years of bats. Perhaps it coincides with a habit humans have picked up in the last 100 years: massive amounts of ever-changing pesticides necessary to maintain blemish-free apples, perfect peaches, weed-free gardens and the productively producing fields necessary to tickle our junk food tongues.

How would pesticides and herbicides and fungicides affect bats? Well, imagine a subtoxic level of pesticide on a moth, a mosquito, a bee, picked up from that apple blossom, clover flower or RoundupReady crop. The chemicals range from specific insect toxins to general, all-'round poisonousness. Some are neurotoxins, some are endocrine disruptors, some are kidney disruptors. Some are quick to degrade, others persist.

Bats eat twice their own weight in bugs every day. That would be like us eating, say, 360 pounds of tuna a day.

Just think of all those omega acids!

However, tunafish in their natural environment, being a top predator, ingest and retain the heavy metals and plastic toxins and other ickiness that has been eaten by everything below it in the food chain. It "bioaccumulates," concentrating

I can't believe I
bioaccumulated
the whooooooole
thing.



in their tuna flesh. Eating tunafish sandwiches all day every day would very quickly raise your own “body load” of toxins and heavy metals. Already the experts say you shouldn’t eat tuna more than once a week.

Might not bats, the top predator of the insectsphere, have bioaccumulated ickiness? Immune systems weakened, hibernation metabolism out of whack, the gradually sickening bats succumb to a fungus their immune systems once scoffed at. They can’t sleep, and are restless all winter, until their restlessness burns off too much body mass.

We don’t know enough about bat habitats, behavior or biosystems to really be sure -- which in itself is amazing. Wouldn’t you think humans had baselines for normal bat physiology? We don’t.

And there’s another instructive tale worth telling on this score: Vultures.

Vultures are naturally funny. Heck, they eat the dead. They’ve got an impassively ugly face, and a hideous smell. What’s not to laugh at?

In India, approximately 99% of the vultures have died from kidney collapse. The culprit wasn’t discovered until 2004, too late for nearly all of the vultures -- a seemingly innocuous anti-inflammatory drug called “diclofenac” given to cattle -- a drug tested on target mammalian species and declared “safe.” When the vultures ate the rotting flesh from the cattle carcasses, they accumulated diclofenac, which pretty quickly killed them. That anti-inflammatory drug, used for treating certain cattle and water buffalo maladies, is still available on the black market. It’s cheap and effective, and the purchasers don’t have much of a clue about the vulture problem.

Consequently, today the Sikhs have no vultures to eat their dead (as their religion prescribes), nor are there vultures to eat roadkill, newly-dead cows (which are, you may remember, not eaten in most of India), or dead many-other-things... leading to minor health hazards (or merely disgusting stench) throughout the land.

The lure of “cheap and effective” also holds true in most modern agriculture, especially the large-scale, monocrop kind. Profit margins are so thin that a few percentage points in productivity for farmers can be the thin, in-the-red line between merely being deeply in debt -- and disaster. So when neonicotinoids -- insect neurotoxins -- become available to keep apple fly maggots in check, they

were very appealing, in the “cheap and effective” kind of way. But neurotoxins (not unlike “antibiotics,” discussed later) kill off the good critters along with the bad -- which means bees and wasps and flies and the apple fly maggot alike.

The problem with all of these examples is it demonstrates one key, essential point about humans: we don’t know what the hell we’re doing.

We act like we do, but we don’t. Humans produce giant amounts of toxic crap -- we mean, GIANT amounts, more than any other critter, and we spread it both thickly and broadly around the ecosystem. From topsoil to troposphere, aquifer to lithosphere, humans spread our crap for other critters to walk in, ingest, and pass on.

Hey, speak for yourself! I’m an expert destroyologist!



And because of who we fundamentally are as a species -- one-step and sometimes two-step idiots, for the most part (see below) -- we imagine that what we do won’t matter. That the oysters will always reproduce, because they’re happy as clams. That the invasive species we brought in with ballast water won’t run riot in a predator-free zone. That species evolved for old growth forest ecosystems will be just as happy in new-growth forest ecosystems (‘cause they’re the same, right?), and won’t have unintended consequences. That the hormone and drug runoffs from our cities won’t affect the fish, because they’re, y’know, fish, and don’t have prescriptions. That we can hunt sentient beings who write songs of love and songs of sadness, because we like their blubber and meat, and oh, it’s “scientific whaling” not murder, because we say so.

In the end, we imagine that Nature will be utterly and continuously resilient, and effortlessly absorb what we spew. Because it always has before, right? Shoot, look at Lake Erie! They were writing that one off in the Seventies!

One- and Two-step Idiots

These are not line dancers we're talking about here. This is the human condition.

The one-step idiot is someone who can only see one step ahead. Kill animal, I can eat it. Hit nail, it will go into the wood. Bury this toxic waste, it's gone. If I wash this shit downstream, it's no longer my shit and I don't have to worry about it. If I spray this crap, I won't have borer worms.



If I throw this away, it will be gone!

Two-step idiots are those who only see two steps away: kill animal, I can cut it up and store it for later.



I'd better take this antibiotic now, because I might be getting the flu!

If I hit this nail, I will have a hard time getting it out if I need to. If I bury this toxic waste, it could be trouble if it's near a watershed. If I wash the shit downstream, I better worry about someone upstream washing their shit down. If I spray this crap, I'd better wash my apples.

Unfortunately, biological systems are way more complicated than two steps. They're an interconnected mesh of interrelationships, all independent of each other, each with certain limits to what it can endure. It's a working anarchy, in which natural variation can be handled over a number of generations, and even catastrophes like hurricanes, tornadoes and prairie fires are temporary, and species can recover.

But hurricanes cease to blow. Prairie fires burn up the dry grasses. Contrarily, the natural catastrophe called "Homo sapiens" is unremitting. We continue to eradicate; we continue to freight the systems with a heavy burden.

And those imbalances have weighty consequences. Because the vultures are functionally gone, carcasses rot. Because the bats are disappearing, mosquito and other pest populations are skyrocketing. Because the amphibians are dying off, everything that depended on frog eggs, tadpoles and toad shit are also under the gun. And the things that depend on them are thrown out of whack.

One- and two-step idiots can't imagine that knocking over this one domino might affect many other dominoes, regardless of their spots.

Evolutionary patterns of codevelopment, codependence, even coevolution, comprise the woof and the weft of the great tapestry of life on our planet. Most of us hapless humans think of evolution as maybe a thing about monkeys, not about hundreds of thousands of generations living and dying in an evolving environment of other evolutionary rhythms. We think only about what is immediately before us.

The worst thing? One-step and two-step idiocy is why we are masters of all we survey. It's how we evolved. That's right, hundreds of millions of years of evolutionary destiny produced beings who feed hummingbirds Nutrasweet solution and then wonder why the hummingbirds died. Oh well. So it goes.

Embarrassingly, being able to think one step ahead was a stunning leap of intellectual abstraction. "If I throw this stick accurately, I can then eat that now-dead thing" gave us a huge energy advantage, leading to advances like "if we stampede these deer off that cliff, we'll have lots of dead deer to eat."

Thinking two steps ahead -- wow! It means I can store smoked meat and seeds, means I can predict that there will be another winter that follows the summer, means I can hunt down large prey and eat like a king. Two-step thinking means we can have agriculture, buildings, amortization tables, supply and demand, and freezer pops.

Lots of dead deer=
a big feast, then lots
of pemmican!

One-step and two-step thinking also leads to these sorts of conclusions: I hate bats and vultures, they're ugly, so who cares if they're gone? Wolves are scary, and I heard they eat babies, so good riddance. Bugs bad, crops good, so kill off bugs.

We'll see other instances of one- and two-step mentation in other converging emergency scenarios, even among really really really smart people ("Greenhouse warming? Fix the symptom by pumping out clouds" or "Topsoil weak? Fix the symptom by pouring on more fertilizer").

What got us here -- the amazing capacity for abstract thought -- is also what may kill us, because we don't think much beyond the pleasure of shooting buffalo and eating their tongues. Realizing that we may end up with no buffalo pretty damn quick, if we're killing them by the hundreds of thousands, is just one step too many.

So again -- the problem is, we're an evolved species, too. We 'Docs realize that every species wants to take over the world, whether virus or bacterium or rodent or amphibian, and that they are kept from doing so by the checks and balances of predator/prey relationships, ecosystem carrying capacity and environmental barriers.

Humans are just a lot more efficient at it than other mindful critters, and have reached thresholds never before seen in the history of the world. We're changing the chemistry of the oceans and the atmosphere and the biosphere. In so doing, we are disrupting or wiping out entire ecosystems, and the species that are intrinsic to them.

Damn.
We are
really good
at this.



To the bats and the vultures -- *see ya! we hardly knew ya!*

To the amphibians and the coral -- *thanks for everything!*

To the species we haven't yet found, with genes that make miracles -- *wish you'd proven your worth sooner!*

To the checks and balances of evolved interrelationships -- *get with the program! The Human Empire is here to stay!*

To the effects of species collapse -- *don't worry! we have zoos!*

To our grandchildren -- *Hush, now. The Discovery Channel will always have reruns.*

The Species Collapse Decade

It's surprisingly tough to see the Species Collapse in isolation. By its nature, Species Collapse has elements of Biology Breach, elements of Climate Chaos, and it's a fundamental Resource Depletion (if we have no sturgeon, we have no caviar!).

It's also both a symptom and a cause of environmental collapse. And it's a lot of canaries dead in a deep dark species coalmine.

But for the purposes of simplicity and clarity -- and because humans are wiping out species ourselves, directly, through poisoning, hunting, over-harvesting, ecosystem erasure and more -- we'll explore it as a separate emergency.

We are hypothesizing a decade in which a number of key species go into catastrophic decline, for reasons we will only dimly understand. In some areas it will be dramatic, in other areas less so. Overall, we'll continue to see these sorts of changes in a Species Collapse future:

- Because of the decline of the birds and wasps and bats that held them in check, various "plagues of insects" bloom. Insects, who have generally evolved to reproduce very rapidly, cause localized devastation: grasshoppers in one state, beetles in another -- and strenuous but functionally ineffective quarantines will be implemented at great cost. Is that the sound of rain, or the sound of grasshopper landing?
- Food, especially certain basics (like soybeans, even corn) may become significantly more expensive, as the collapse of key predators (whether birds, or insects, or mammals) results in sudden explosions of prey -- plagues of rodents, insects, worms, and larvae. Yet we'll still have Corn Pops with Log Cabin corn maple syrup for breakfast.
- Northerly climates, and more biodiverse ecosystems, may fare better than U.S. midwestern industrial agricultural lands, having more intrinsic biological diversity, and thus bio-resilience... but that may lead to a short-term rise in corn and soybean crops, which leads to boreal forest destruction, to make room for corn farms. The Canadians say "It's my property, eh? I'll grow soybeans as I please."

Can I get
that deep
fried?



Time to
fix up the
garage!



- Certain areas will experience wild fluctuations in property values, with consequent community devastation. A permanent infestation of unchecked species -- because their primary predators have died off, been killed off, or gone north -- will leave towns and regions essentially untenable. This will cause great economic turmoil, and hundreds of millions of economic refugees, even within developed nations.

- Fish populations -- a source of nearly half of the raw protein available in the world -- will continue to decline. The increasing prices will encourage even more invasive fishing techniques (far beyond the miles-long drift nets and deep-sea trawling currently hoovering up indiscriminately [right, Baiji?]). The high prices even encourage rogue, unregulated pirate trawlers. This feedback effectively destroys the ocean's ability to recover, in most traditional fisheries. See the early 1990's collapse of the Northern Cod -- and the economy of Atlantic Canada fishing communities - to see what that's like.

Bluefin tuna:
worth its
weight in
gold...at least
'til it's gone.



- Similarly, as food prices go up, the bushmeat trade increases in developing countries, continuing to denude the jungles and forests and biodiversity hotspots of vertebrate life. Snake stew, anyone? Hippo steak?
- In the developed world, semi-wild bushmeat also begins to decline, from pigeon to squirrel to deer, in the bush or on the prairie, in the suburban woods or in the parks. News analysts hypothesize that the decline has something to do with the economy.
- Invasive species -- the Asian Carp in the Great Lakes, the quagga mussel, the pine borer, the lionfish, and more -- wreak financial devastation within multiple sectors, leading to increasing costs, sudden drops in market niches, and turmoil among distributors and resellers. "What do you mean, there's nothing to ship, and no one to buy?"
- Biotechnology and biological sciences go into practical research mode, trying to compensate and ameliorate, and trying to understand why coral ecosystems are

being overrun by seagrasses, or why plagues of mosquitoes are now spreading disease, or how to regrow wooly mammoths from their DNA.

- Al-Qaeda and the “war on terrorism” in general is recognized as functionally meaningless -- and hungry, besides -- compared to the real crisis.

Cue lush orchestra soundtrack as we embrace the enemy!

- Greenhouses, gardens and humanly-tended heritage crops become more important, as well as profitable, because it’s easier to prevent a plague of pests that way.

More farmer’s markets means more folk singers get more gigs.

- Microagriculture becomes vital to community health, and even survival -- as well as making for fabulous potlucks!

- Standard shipping methods will continue to operate, even though it gets somewhat more expensive (based on current trends, not even considering peak oil).

- Canning and storing food when it’s plentiful will become routine in homes. “Style” sections of newspapers will focus on “the new homemaker,” of whichever gender is unemployed.

- The Internet and other forms of telecommunication and entertainment continue to grow in importance as an affordable respite, and as a way to follow this month’s species collapse events like we follow celebrity scandal.

**Food Channel ratings skyrocket!
Rachael Ray rules!**

The Sixth Extinction will gets its numbers boosted by the collapse of basic ecosystems -- plankton and diatoms decrease their fecundity in a warming, acidifying ocean, which starve what fish are left; coral reefs dying from same, taking a third of aquatic species with it; therefore seabirds starve and die off; therefore the mites that lived on puffin wings go extinct.

And the mites may matter to microbe dispersal in a connected ecosystem.

*And the mites and microbes
influence the macrobes
while the great ecostrife
unravels Earth's life.*

The burgeoning Apocalypse may bring out the poet in us all.

Maybe we'll call it the Apoetcalypse.

4. RESOURCE DEPLETION

Doc Jim: What's in your hand?

'Doc Michael: Guess.

'Doc Jim: Give me a hint.

'Doc Michael: Okay, well look at the chapter head.

'Doc Jim: 'Resource depletion'.

'Doc Michael: right....

'Doc Jim: So it's a resource that is growing more scarce.

'Doc Michael: That's right, little buddy.

'Doc Jim: Thanks, Skipper! I know: It's clean water.

'Doc Michael: That would be a natural first guess, but no.

'Doc Jim: Oil?

'Doc Michael: That's the resource we go into later. You did read this chapter ahead of time, didn't you?

'Doc Jim: Well, sure! I've just, uh... well, no. I've been busy!

'Doc Michael: (frowning) I suggest you get 'busy' guessing what's sitting in my palm.

'Doc Jim: Then it's forests... maybe even the Amazon Rainforest.

'Doc Michael: In my hand?!?

'Doc Jim: Oh sorry, thought this was theoretical.

'Doc Michael: It is in a sense. Any more guesses?

There's a hole in our
bucket - as big as all
outdoors.

'Doc Jim: Food?

'Doc Michael: Some desperate people USE it as food.

'Doc Jim: Aha! It's dirt!

'Doc Michael: Brilliant.

'Doc Michael opens his hand. A speck of dirt is in the palm of his hand.

'Doc Jim: Hello, speck of dirt.

'Doc Michael: Cute little guy, isn't he?

'Doc Jim: Don't get any romantic ideas.

'Doc Michael: Do you know why soil is a "depleted resource"?

'Doc Jim: Let's ask it.

'Doc Michael: It's not a talking piece of dirt!

'Doc Jim: The ding-dang dolphin in the first chapter spoke! And in English in fact!

'Doc Michael: Fancy that.

'Doc Jim: All right, then. Soil is a depleted resource because it's degraded in quality due to human activity.

'Doc Michael: That's right, 'Doc Jim. A study in 2009 examined soil quality around the globe and found that 25 percent of the earth's... earth... is in bad shape.

'Doc Jim: Mostly, I gather, from bad agricultural practices.

'Doc Michael: Slash-and-burn, intensive farming tactics, overgrazing -- all the machinations to maximize profit to feed our ever growing population.

Pause; 'Docs ponder overpopulation...

'Doc Jim: It's also the erosion.

'Doc Michael: Absolutely, the effects of human activity, from the building of roads, to subdivisions, to –

'Doc Jim: And once the soil is depleted, it's very hard to restore.

'Doc Michael: As most things are... Then add to the equation the effects of global warming: desertification, “dust-bowl” extreme weather patterns, and the like.

Pause; 'Docs stare at the piece of dirt in 'Doc Michael's hand.

'Doc Michael (cont.): There is...

'Doc Jim: Yes?

'Doc Michael: That other way that soil is depleted.

'Doc Jim: How? Oh right. People eat it when there is nothing else to eat.

'Doc Michael: I can't think of anything more unthinkable.

Pause

'Doc Jim: As doctors, we're trained to be dispassionate about this.

'Doc Michael: We're not really doctors, Jim.

'Doc Jim: Right. (pause) May I?

'Doc Jim holds out his hand; 'Doc Michael places the piece of dirt into 'Doc Jim's hand.

Pause; they stare at it.

'Doc Jim (cont.): He *is* cute.

Let's take a peek at
Peak Everything.

WE HUMANS HAVE A DEEP TRADITION, one that goes back to the earliest days huddled around the fire, trading Ook and Eek jokes. That tradition is "use it up and then move on."

The problem, of course, is that we've run out of easy stuff to use up, and we've run out of unused frontiers.

One iconic example of Resource Depletion thinking is Peak Oil.

The basic premise of Peak Oil is that humankind has already burned up the easiest-to-acquire oil and natural gas in the world -- the stuff that we can be simply pumped right out of the ground. Once past peak -- the halfway point -- getting energy costs more energy, and the acquisition energy required costs more itself, causing a spiral in costs and availability.

The question is when we hit that tipping point. When we hit the peak (and many say that happened in 2006), then the cost of energy begins to inevitably rise -- albeit chaotically, in fits and starts, but eventually dramatically and rapidly.

For modern society, when oil hits \$150 to \$250/barrel (resulting in \$7-\$15/gallon gas and diesel), then all sorts of presumptions begin to go awry -- not unlike what happened the day that credit default swaps were discovered to be absurd.

Unfortunately, oil has become completely intrinsic to our just-in-time society. We've been mainlining it, and, like any long-term junkie, the paroxysms of rapid withdrawal could be dramatic.

That junkie -- Homo sapiens -- has had a garage full of its "medicine" for generations. What happens when it realizes the supply is nearly gone?

Sadly, this same "peak premise" can be applied to nearly all our fundamental resources. Aquifers -- sometimes called "fossil water" -- are being drained for agricultural irrigation. Most of the powerful rivers have been already been dammed, and wells are going dry. Most of the glaciers, whose melt-off produces the fresh water for more than a billion people, are not being replenished. Many

The Dead Sea...
is sure living
up to its name.



analysts think that water access will be the kindling for the next world war.

We're also in danger of hitting "peak minerals." The easiest-to-get lithium, copper, magnesium, iron, and other minerals vital for modern life has already been harvested -- when energy was cheap! Gold, platinum, silver, and titanium are all oversubscribed. As mining and processing gets harder, it gets more expensive, and eventually, it will be too costly to afford.

Fundamental minerals are at the base of our industrial food system, and while many are still temporarily abundant worldwide, the United States, for example, is a net importer of potash and nitrogen, because domestic supply has already been depleted.

Humans have found temporary fixes to some limits -- for example, for the soil depletion featured in our little ApocaDoc exchange that began this section: blanket the wimpy soil with energy-intensive fertilizers. But this fix can also only go so far, especially if energy prices begin to go up, and nitrogen and potash prices increase. After all, the scarcer the hen's teeth, the more pricey they become.

Perhaps most horrifying, the ocean is becoming depleted beyond our imaginings. According to most estimates, in the last fifty years our fisheries -- the vertebrate life of the ocean -- have dropped to 10 percent of their former strength. Orcas, seals, whales, salmon, and more are starving to death as their food sources dry up. We have been robbing the bounty of the ocean with miles-long nets, wiping out ecosystems we don't even understand. Even anchovies -- those little salty delights -- are becoming rare. And species like the Baiji are, simply, vanished -- the capital "D" Depleted.

The darkest of the "peak oil doomers" envisage a sudden spike in prices, catastrophic supply breakdowns and a "long emergency" in which commuting is no longer viable, where suburbs become cut off from their urbs, where food not grown within walking distance becomes merely an imaginary salivary stimulant.

We ApocaDocs think that's a little extreme -- after all, a crisis is just an opportunity in wolf's clothing. Stone soup goes a long way. And surely the value of suburban mini-mansions will always go up, right?

The convergence of multiple resource depletions holds real danger, because (you may remember) we're talking about systems. If fish harvests continue to decline, the fishmeal used to provide cheap protein to "farmed" salmon (and chicken

and beef) becomes more expensive, so perhaps we'll change to soy. But soybeans require topsoil, and if fertilizer is increasingly expensive, then the price of that protein increases. And if the cost of moving those beans from farm to processing plant rises (not to mention the fuel costs of harvestin' them beans), then we're reaching deep into our increasingly shallow pockets.

We can almost hear the deniers' voice... "that's a lot of 'ifs,' ain't it?"

Well yeah, except for all the evidence that we're using everything up as fast as we can now, because baby needs new Nikes, and we need to get while the getting is good. How else will the economy continue to grow?

The Resource Depletion Decade

We are hypothesizing a 10% per year increase in energy and materials costs (note: oil was \$50 a barrel two years ago, and we all remember when it exceeded \$100); an early-decade collapse of most ocean fisheries; and specific "peak resource" chaotic speculation for oil, minerals and most commodities.

- Increased transportation costs for everything starts to create spiraling, fundamental worldwide depression -- putting the current "just in time" delivery and distribution systems, and globalism in general, in jeopardy.
- Commuting costs, suddenly dramatically higher, begin to eat into the viability of suburbia (see *The Long Emergency*, by James Howard Kunstler), deeply affecting home values in those areas, creating even more economic strife. You thought the recent foreclosures were bad?
- Alternative energy sources start being economically competitive (though still expensive) -- solar, wind, water, nuclear -- but can't ramp up quickly enough to prevent the worldwide depression.
- Fundamental products like food (meat, produce, even flour) rise in price as fertilizer, mechanized production and transportation costs rise. We all become vegetarians... when we can get vegetables.

The
economic
collapse
of 2008 is
just the
tip of the
priceberg.



- Fisheries collapse worldwide, raising the price of fish, thereby encouraging rogue profiteers, corporations and other pirates to keep on fishing. If you know the right somebody, and have the bucks, then it's "Sushi, anyone?"
- Airfare and air transport become much more expensive. Frequent flyer miles are denied.
- High-energy, high-fertilizer, transport-heavy agriculture becomes increasingly untenable. Backyard gardens become *de rigueur*.
- Trains will likely become cost-effective again (helping large urban areas more than remote areas).
- Internet use -- for telecommuting, entertainment, delivery efficiencies, coordination of commuting, shopping and more -- becomes vital, not just a distraction. "Social networking" = "survival networking."
- The "consumer society" grinds slowly to a halt, causing dramatic disruption in China and much of the "outsourced manufacturing" world. Ebay becomes a lifeline, though the cost of shipping Aunt Mina's dresser anywhere prices most out of the market.

I just love *de rigueur*...
especially slathered
in butter!

OPEC = Oil
Prices are
Economic
Carnage



- The "war on terrorism" is ratcheted up to a "war on Arab terrorism," the OPEC nations being an easy target of blame for "holding our energy future for ransom."
- Walking-distance centralization (stroll or bike to grocery stores, etc.) succeeds over driving-distance centralization (Wal-Mart, malls, etc.).

The "general store" makes a comeback.

- Low-energy hand crafts, community gardens, bicycles, community cooperation, and friend networks rise in value and practical utility. I knit, therefore I am.

- Economic models for steady-state sustainability, rather than constant-growth models, become much more interesting to economists and citizens. E.F. Schumacher wins the Nobel in Economics postmortem.

Postmortem
accolades still
feel so
posthumously
good!



This Scenario promises a slow-motion, economically-grinding spiral down into a worldwide, desperate depression. Even those lucky few with farms and fields will suffer, though perhaps not as dramatically as those in mostly urban landscapes.

Ack! We started going down the horror spiral, again!

We're sure the invisible hand of the market will save us!

Can't we spend our way out of this?

Can't we get a time machine and start over?

We won't mess up again, we promise!

Please?



5. BIOLOGY BREACH

Oh my, what do we have here? We may need to open the big doors for this patient -- even the massive doors.

So. Um... welcome.

You mean we *don't* know better than Mother Nature?

You are -- let us guess -- the Great Pacific Garbage Patch. Thank you for coming in. We 'Docs have long wanted to examine you. There are so many garbage gyres now in the oceans, but you are the Mother of all Plastic Garbage Patches.

Does that make you proud? We know you don't have a consciousness per se, but anthromanticizing you helps us understand the scale of your destruction.

You are twice the size of Texas, at least. Most of you is just below the surface so your enormity is not necessarily visible.

It has been estimated that you contain 100 million tons of debris.

Some scientists now believe it is not possible to find the edge of the spread of your toxins. There is no discernible shore to your continent.

This debris is human made and human discarded. You are emblematic of our overconsumption and our mindless waste; a living, breathing beast slowly killing the ecosystem in which you are fashioned by ocean currents and wind patterns.

You dissolve but never disappear. You remain a polymer as you degrade into smaller and smaller bits, consumed by ocean creatures, both water- and air borne. You lodge in the digestive tracts of these animals, causing great pain and ultimately death.

There is so much marine litter floating in the waters of the earth and washing up on shores everywhere that we wonder sometimes if this is some maniacal attempt to reunite the continents as one.

We're reminded of the Yeats poem and this first line.... *Turning and turning in the widening gyre...*

Are we slouching towards Pangea?

LIFE IS FREAKIN' AMAZING.

It has developed over hundreds of millions of years, going through periods of astonishing diversity, frightening changes, and massive extinctions, depending on the lens of microbiology and macrobiology you decide to strap on.

Let's take a moment, and step back.

Life as we understand it began about 3.5 BILLION years ago.

Fish with backbones appeared some 400 million years ago; the fossils of the earliest mammals, about 200 million years ago.

Humans, as "homo sapiens," arrived about 200,000 years ago; modern, civilized, agricultural humans -- those who began the current explosion -- about 10,000 years ago.

Thank God that the last 10,000 years are the culmination of all that time!

To those of the zealot persuasion, it's obvious: the last .0005% of vertebrate time -- our time -- is clearly the pinnacle!

To those of the most cynical persuasion, it's obvious: this brief .0005% of vertebrate time is clearly an aberration!

But this is the time we're in, for good or (as seems likely) for ill. These days -- the last 100 years (.000005% of vertebrate time) we've learned a helluva lot about the biological world -- heck, it's only been 150 years since *The Origin of Species*, after all.

"Zealot
persuasion"...
great name
for a
band!



Sadly, the more we learn, the more we understand that we are clueless. Well, not clueless per se, but rather tunnel-visioned.

Humanity understands facts, not systems. We watch the behavior patterns of dragonflies, and think “that’s the behavior of dragonflies,” rather than “that’s the behavior of dragonflies at the tail end of a ten-year cycle in the middle of a forty-year prey cycle in the midst of a ninety-year weather cycle when we’ve had two years of unexpected drought and a burst of nematodes, which eat the root worms, whose moths are candy to fertile female dragonflies.”

Please note that the previous paragraph is metaphoric: we don’t know what is candy to fertile female dragonflies, though if we did, we’d probably see ads for that pheromone in the Farmer’s Almanac.

Unfortunately, over the last few years of exploring the “Biology Breach” scenario, the ApocaDocs have learned a painful lesson about the biological sciences.

Symphonies...
are just... so...
complicated.



What many of the specialists are doing is not what we need. We’re not seeing forests, we see reporting on trees. Humans analyze symptoms, without confronting causes. We critique every identifiable instrument, and but are deaf to the symphony.

Biomes -- the interconnected systems of plants and animals in a region

-- evolved over hundreds of thousands, even millions of years, based on local weather patterns, lifecycle habits, and land structures; based on predator/prey relationships, pollination mechanisms, seeding and birthing scheduling, and oodles of other delicate interrelationships. These relationships maintain stability in a biome.

Unfortunately, human activities over the last century have been dramatically disrupting these stable systems. Some of the disruptions are direct -- DDT is the easiest example -- but others are more subtle, affecting delicate systems we only faintly infer.

As we learned from our mute patient, the Great Pacific Garbage Patch, the plastics we dump into the ocean break down into tiny little plastic particles, and

in the process release Bisphenol-A (a fertility disruptor) and other ugly-nasties.

But the plastic particles almost never fully dissolve – and they clog the gills and digestive systems of fish, birds, and sea mammals. Plastic just isn't as nutritious as, say, plankton, or small fish. It's like us eating Saran Wrap, instead of Jell-o.

The lead, mercury and other heavy metals we pump out of our coal plants into the clear blue sky settles onto multiple biomes.

In August of 2009, the USGS reported (after a five-year study of streams and fish) that every stream and every fish had high levels of mercury and other toxins. Every stream, every fish. That's shit we've put into them, and it's a gift that just keeps on giving.

Lots of these ickies accrete up the food chain (as we discussed in Species Collapse), getting more concentrated, causing all sorts of problems. Predators like tuna, dolphins, salmon, trout and swordfish have heavy metal (and PCB, flame retardant, and other yummy spices) concentrations that make their flesh a slow poison. In humans, heavy metals cause, among other things, neurological problems, including making us more stupid. Hey, maybe that explains it all!

Phthalates:
the
word for
blowing
a raspberry
with
your lips.



In November 2009, a study by The University of Rochester found that male fetuses exposed to high doses of phthalate plasticizers in the womb were “less likely to play with boys’ toys like cars or to join in rough and tumble games.” Phthalate exposure also may be responsible for the rise of genital abnormalities in male infants, along with affecting the developing brain by obstructing testosterone production.

Humans basically pee and shit into every stream available. The prescription drugs we urinate into our sewers and streams don't get treated before being

released into the waterways. Sadly, these hormones produce endocrine system disruptions in most living creatures -- which is why we are seeing hermaphroditic fish, and may explain why many oyster beds have stopped reproducing. "Happy as a clam" may disappear from our vernacular.

The fertilizers we pump onto our fields leach into rivers and bays, which overfeeds algae, leading to oxygen-free "dead zones" in the ocean hundreds of square miles huge.

And those are among the more benign things we do to the infinitely-older biomes we inhabit.

The problem is that none of this happens in a vacuum (a vacuum is what's called "space," and it surrounds us out into infinity). Instead, it happens within a pretty small, confined world. Too many of the things we pump out simply don't degrade -- they just pass from critter to critter. Others "bioaccumulate," like heavy metals settling in predators. And still others just screw systems up -- and when you screw with parts of a system, the entire system is weakened.

Biome systems are interrelated, interdependent, even codependent interactions between lifecycles of plants, animals, insects, fungi, microbes, and the Sun. Screwing with those systems, on the scale we're screwing is, fundamentally, an idiocy.

It's lk tkng vry vwl away from what you type. Or, ai ee ooa. It's like removing just two wires from your in-home entertainment system. It's like having Twinkies without a creamy filling. How can it still function as a Twinkie?

We ApocaDocs have been forced to think in interrelated systems. Ocean acidification is a humongous "Biology Breach," endangering coral, seahorses, phytoplankton and most fish worldwide. But it's also entwined with "Climate Chaos," since CO₂ is also causing acidification. But it's also a humongous "Resource Depletion," since we get about a third of humanity's protein -- some say ultimately half -- from the ocean.

The albatrosses that are force-feeding their chicks lighters and other plastic pieces (thinking it's fish) end up killing 95% of them; the puffins starving because of sealife changes we have caused -- isn't that also "Species Collapse"?

Let's throw
out
the baby, the
bathwater
AND
the bathtub!



Our warming of the oceans is breaching the stability of the coral systems. Our rapacious farming of the Midwest has wiped out the stability of the grasslands and the topsoil. Our sewer systems concentrate the hormones we urinate, which disrupt the endocrine systems of the fish in our rivers, and the other animals which feed on them. The acidic rain that falls on forests disrupts the

balances within the soil, damaging the health of every tree within it. And then... there goes our carbon sinks.

It's all systems: We kill the wolves, because we don't want them eating our sheep – and then we wonder why there are so many deer munching our gardens. We cut down the hillside trees to build condos, and then wonder why we have landslides during a hard rain. We strip-mine the ocean with driftnets and trollers, and then wonder why the fish are in decline.

As the 'Docs are finishing this revision, the Gulf Gusher oil slick has grown as big as Maryland, and BP is "studying the problem" of methane crystals inside the jerry-rigged containment "dome," before trying Plan G or H. This stunning spewage of marine death may be beyond human comprehension. That we allowed ourselves to play Russian Roulette with the Gulf ecosystem, without planning for multiple failsafe mechanisms -- and that we allowed the "lowest bid" to determine the fate of the Gulf -- says more about our myopia than any quip or *mal mot*.

It can be argued that humans are the most invasive Biology Breach species of all. From our origins on the African continent, we proceeded to invade the entire planet -- in the most dramatic diaspora-of-death ever. We systematically killed off other predators, then killed off large herbivores, and then moved down the size scale until we had to start growing our own food, and then began systematically poisoning what we couldn't see. No other species has ever spread so far, and made so many alterations to the environment, as have humans.

People aren't
all bad. We
invented
*Dancing With
the Stars!*



The list of those alterations is seemingly without end -- even the ApocaDocs can only hope to tickle the very tip that implacable, quickly melting metaphorical iceberg.

Ultimately, everything humans have introduced into the environment, intentionally or unintentionally -- pollution, cane toads, rats, zebra mussels, kudzu, pathogens, estrogens, billboards, GM foods, etc. -- can be considered an intrusion of non-indigenous biological factors. We can think of but a few biology breaches that can't be blamed on humans: volcanoes, tsunamis, and earthquakes. Of course, a meteor slamming into the planet is the Mother of all Biology Breaches. But we think of those as being of a different.... species of calamity.

And some days, we yearn for some Apocalypse to happen to humans, to perhaps save life on earth. But then we think: "Nahh. Life will continue regardless. In 0.005% of the lifespan of vertebrate life on the planet -- say, in 100,000 years -- all will be forgotten."

The Biology Breach Decade

Understanding this Apocalypse requires "systems thinking," at which, we have noted, humans are notoriously poor. What's needed is more than "third-step mediocrity," but rather "fifth-step brilliance."

We 'Docs don't, unfortunately, expect a sudden awakening of 7 billion minds into a new age of enlightenment. We expect business as usual, in terms of humans continuing to breach our planet's biology, over the next few years.

We are projecting, over the next ten years, using mostly pessimistic predictions, the following scenarios:

In
Second Life,
I have a
Third Life.



- Immune and reproductive systems of many animals will be increasingly compromised because of humanly-produced toxins (endocrine disrupters, heavy metals, etc.). We will see more massive die-offs like those of the bats in the Northeast from white-nose syndrome, wild pollinators and honeybee colony collapse disorder, the salmon's 90%

decline in many rivers, and the generalized amphibian collapse worldwide. These die-offs will have unexpected results: explosions of formerly-grazed insects, bad harvests of many fruits and vegetables, increased competition for limited catches, and related die-offs of codependent species. On the plus side, virtual reality will show a significant growth curve.

- Invasive species -- such as the Asian Longhorned Beetle currently chewing on the maple trees in North America -- will cause dramatic impacts on existing biome balances. Forests will burn as dead trees become tinder in drought- and heat-dried regions. Predator-free invasions (like the quagga mussel and Asian carp) will outcompete and shoulder out indigenous species, in a rare case of existing biobalances of predator and prey working against stability.
- Unexpected results from genetically engineered plants will cause dramatic disruptions in multiple biosystems, as “genetic drift” produce RoundUpReady weeds, as drought-resistant DNA affect wetland plants, and monocrops are affected by surprise diseases (like we have seen in 2009 with the potato/tomato blight).
- Overwhelmed by a surfeit of carbon dioxide, our oceans acidify, producing massive die-offs of coral reef and other keystone marine biomes, which rapidly (over a span of two to three years) results in the death by starvation of countless ocean life dependent on those biomes. This produces localized but dramatic collapses of fisheries, and the communities dependent upon them. A rush of ecotourism provides a transitory economic boomlet, quickly followed by devastating collapses.

Climate collapse is
a *fabulous* tourist
attraction.

- Coastal areas will be breached, according to some estimates, by more than a meter by the end of the century; in the next decade, storm surges will wash away great swaths of economically valuable coastland, and damage the infrastructure of most coastal communities. Greyhound Bus lines, and soup kitchens in inland communities, will prosper.

- Warming climates create shorter hibernation and reproduction cycles. Many of these mammals won't hibernate or reproduce at all -- putting entire species at risk of starvation, and putting the other codependent species at risk (see “Species Collapse”).

- Environmental toxins (like phthalates, above) increase early-onset puberty in many young mammals, including human boys and girls, disrupting normal growth and development. Nine-year-olds with pubic hair create more public concern than the more-rapidly-reproducing rodents.
- Leukemia, Lupus, violent allergic reactions, and other immune disorders begin to compete with Cancer as the biggest health fear within developed nations. Organic food markets boom, along with bottled water, deep-glacial ice in top-shelf clubs, and Dr. Bronner's fine print.
- Giant dust clouds, along with insect migration to now-warmer climes, assist in the transcontinental dispersion of influenza, SARS, heavy metals, fungi, bacteria, malaria, and other unpleasant elements. At least two Southern cities declare a "war on mosquitoes," and political pressure to "penalize" China and Russia for "their" toxins will increase.
- Desperate to sustain current lifestyles and energy needs, humans continue to exploit existing natural resources; at the same time our aversion to out-of-pocket costs encourage the externalizing (into the environment) of all ugliness, thus accelerating all current crises.

My
drywall
ate my
house.



We elect the
people who
tell
us what we
want
to hear.



- Politicians will blather on about a war on terrorism, and free markets, and protecting existing industries, and taxes on productivity, and the need for a robustly growing economy, and will treat each Biology Breach instance as an isolated oddity – because understanding complexity is almost as difficult as communicating it.

- Overall, we will see tremendous economic disruption, because of unanticipated consequences. Surprises like giant oxygen-free areas of the ocean, because of our effluent; a dramatic rise in infertility across mammals, because we pump out fake hormones through our plastic; basic crops increasingly produce allergic reactions in many humans, because

Get your
OWN
gated
community!



invasive artificial genes have drifted.... And the invisible hand of the marketplace will mean that a few people will still get (or remain) extremely wealthy, and they will have no reason to encourage change.

Alas, many of these Biology Breaches are not solvable within a single human lifespan, because the accumulated toxic reach of our actions can extend to three to five generations. Some, like the unintended consequences of genetic modification, or ocean acidification (if not addressed quickly), may be impossible to repair.

We need to return to living lightly on the earth.

And making decisions with the seventh generation in mind.

Or at least the fifth generation.

Or how about the third?

Can we get a second generation?

I'd settle for
this
generation
"getting it."



E. CLIMATE CHAOS

It came to the ‘Docs’ attention only a couple of years ago that the ocean, hard at work gathering CO₂ into its bosom, was growing increasingly acidic. The more we learned, the more disturbing it became, because ocean acidification is a phenomenon quite apart from the rising temperatures normally associated with carbon emissions.

When it’s hot, it’s hot.
However, that’s
just a theory.

Perhaps if we called our overall climate threat “global acidification,” it might be a more effective wake-up call to humans.

Since the Industrial Revolution, oceans have been absorbing large amounts of our extra CO₂. In the water, CO₂ and seawater combine to form carbonic acid, which increases acidity, making it harder for tiny marine critters to mobilize calcium carbonate. Calcium carbonate is essential in forming coral skeletons, constructing shells and pearls, and building the exoskeletons of marine plankton.

Every day, the oceans sink 20 million metric tons of CO₂ -- nearly twice the amount emitted by the US in a single day.

The consequences and implications of this boggle the apocabrain. But rather than haul the entire ocean into our admittedly prodigious treatment room (we DID have both the earth and the Great Garbage Patch in here earlier, and boy, was there a mess to clean up after), let’s bring in a special guest from the oceans, a tiny but essential little creature called a coccolithophore [C], as representative of umpty-ump other similar ocean critters.

‘Docs: Hello, little coccolithophore.

C: Hullo.

‘Docs: May we call you “Cocco”?

C: I’d prefer “Lith.”

‘Docs: Really?

C: No, I'm just funning you. I thought you ApocaDocs liked to be funned.

'Docs: (uncomfortable laugh) We do! Thank you for funning us!

C: So call me Cocco. I do like the ring of that.

'Docs: All right, then. Tell us about yourself, Cocco.

C: Well, we coccolithophores have a lively imaginative life, but that's not what you're concerned with right now, is it? I heard your little intro, so I know you're trying to use me as an indicator of what's happening to climate as a result of acidification.

'Docs: You are correct.

C: So. I'll address myself just to that little mission of yours. We surround ourselves in layers of tiny calcium carbonite plates.

'Docs: Kind of like the Yes Men's "Survivaball?"

C: Sure, or a man-in-armor kind of costume. Regardless, acidification leads to declines in calcification, and when we've lost our armor, our costume, we become naked and exposed and it's not just embarrassing, it's downright deadly.

'Docs: We can imagine. It would be tantamount to us losing our lab coats in a raging snowstorm.

C: Um. Well, anyway, so when the coccolithophores start to die off, what happens? Well first of all, all the sea life that like to eat us have to figure out what else to eat instead, or they'll go hungry. Secondly, one of the fun things we coccolithophores do is create these massive algal blooms. These blooms are lighter than the surrounding waters, and serve to reflect sunlight back to the sky. Without the blooms, more sunlight is absorbed into the waters, making the oceans and seas even warmer. I believe you Docs call that the albedo effect, and it's an essential way of keeping the planet cool.

'Docs: Homer Simpson calls it the "albe-d'oh!" effect.

C: Does he. Ahem. May we continue.

'Docs: Of course, Cocco.

C: All right, so. The amount of sunlight reflected back to the sky is reduced – not good. Secondly, we Coccos normally produce dimethylsulfide which enters the atmosphere, stimulating the development of clouds.

'Docs: Really! You are cloud creators?

C: In a sense. So if we're in trouble as a species, then there isn't as much dimethylsulfide, leading to decreased cloud cover over the oceans, resulting in further warming, as yet another reflective surface has bitten the proverbial dust. Albedo is albedone.

'Docs: Clever, Cocco!

C: Thank you. I have to get some pleasure from life.

'Docs: Well, for such a little guy you sure get a lot done!

C: Yes, we coccolithophores do get a lot done, and in an acidified environment, our work will be compromised, if not absolutely destroyed.

'Docs: Thank you for joining us, Cocco. Now run off or swim off or float off or however you locomote off back to your ocean environment. Good luck!

C: I'm going to need it.

'Docs: And thus so are we.

YEAH, WE KNOW: CLIMATE CHAOS HAS BEEN "DONE." Al did it first.

Though actually, a whole lot of people did it before Al, mostly dweeby scientists who couldn't get the word out, or who were too focused on validating hypotheses to acknowledge that they were researching and reporting on something that was world-changing.

"Climate change" is the new name for that former buzzword, "global warming." Branding matters, of course, and "climate change" makes it clear that we're not talking about just warming -- but also about drying, wetting, cooling, blowing, stalling, revving, and plenty more.

We ApocaDocs call it “Climate Chaos” because WeLoveBrands™, but also because of how interrelated things are in this ol’ world of ours.

Climate Chaos, as an apocalyptic scenario, is utterly predictable, according to mountains of evidence from the most dispassionate scientists in the world, who can hardly believe what they’re seeing. But it’s chaotically unpredictable, because the interconnecting systems are beyond our ability to accurately model, and at every turn we see unexpected impacts, effects moving “faster than expected,” or some surprise, like a demon jumping from a birthday cake.

Many interrelated feedback systems are at play: in the human systems, we have China building two coal-fed power plants every week, and an increasing desire within India (one+ billion), Indonesia (one+ billion), and Africa (one+ billion), and more for an increasingly energy-intensive lifestyle -- one very similar to what we have in the US (“SUVs for All!”). We have television and the Internet to thank for making the fruits of a consumerist society attractive, even gleaming, to the several billion without it.

Maybe it will
turn out just
fine, without us
having to do
anything!



The demand for energy to turn India, China, Indonesia and Africa into one big mall (and to produce steel and concrete and roofing and Zhu Zhu Hamsters and Barbies) is, of course, most cheaply met by treating the atmosphere as an open sewer – with consequences quite stunning: now nearly 390 parts per million of atmospheric CO₂, a scientific consensus that we are in the midst of slow world suicide, and the creation of beachfront property in Greenland.

Albe-d’oh!



There are the feedback systems going on that make Jimi’s howling winds seem like Mozart: The former permafrost now melting in Siberia, Canada and China is releasing gigantic amounts of methane, a powerful greenhouse gas. The increasing openness of the Arctic waters means less reflection, and more absorption, of solar heat. Consequently, methane hydrates have begun bubbling up

from where they've been trapped for umpty-ump centuries, beneath chilly Arctic waters.

Elsewhere in the world, there is good evidence that many plants, as the temperatures rise, begin to release CO₂ instead of absorbing it. Sort of like breaking out in a cold sweat, plant-style.



And as ambient heat rises, corn and soy yields begin to “fall off a cliff” as one scientist put it, putting pressures to bear on economies and stomachs worldwide.

As the glaciers retreat (as 99% of them are doing in North America), the land absorbs more sunlight, and retains the heat longer (more albe-d'oh!). Glacial meltoff is responsible for a billion+ people's drinking water. In the old days, snow and ice

recharged those glaciers in the winter. These days, in a spanking-new greenhouse world, that's no longer the case -- leading to an unquenchable thirst.

The ocean is warming faster than has ever been recorded, and consequently coral reefs are dying at unprecedented rates (with an extra-special boost from increased acidification from CO₂, which inhibits coral from forming calcium carbonate, its basic structure). That would seem only sad, were it not for the fact that coral reefs are responsible for about a third of marine biodiversity, and are intimately intertwined with the food web of the rest of the ocean. We know how Cocco feels about all this.

And the chaos just keeps on giving: there's strong evidence that weather extremes are increasing. Hurricanes, tornadoes, droughts and deluges will likely continue to compete with Brangelina for headlines. We are already seeing changes in monsoons (in India, we're seeing “rivers of no recharge”), changes in seasonal rains (as of 2009, the formerly like-clockwork “small rains” have not come to Kenya for three years), and stronger hurricanes than whatever “normal” was, decades ago.

It's raining ...
hopelessness.



It is said that in Australia, they've stopped using the word "drought" -- for that implies it will someday rain again.

The interconnected, mutually exacerbating systems make this apocalypse exceedingly difficult to halt, and "very difficult" to slow down.

It'll be especially hard to slow down because our existing economy is so very dependent on using the atmosphere, the land, and the oceans as a convenient In-Sink-Erator. For a couple of hundred years, that's been the path to riches. And since the corporations with the most profit tend to be the ones with the most power, the most powerful financial entities are resistant to change. They have stockholders who continuously press for growth and dividends. They have no ethical drive to save the future, they have only the practical drive to boost quarterly earnings. Best of all, they have the money to buy lobbyists, politicians, newspapers, television stations and generate propaganda all day, every day, all year long.

**Bologna Prettified is
not nearly as tasty as
Spam Svelted.**

We've all seen the ads for "Clean Coal" and "Better Petroleum." Clean coal is a bunch of hooey, to put it politely. And "better petroleum" is "Bologna Prettified" (we were going to use a different "b" word, but this is a family show). But both sure make a great sales pitch. It's always just around the corner,

merely a transformative technical breakthrough away.

Given all that, the dominant economic paradigm is unlikely to turn itself around fast enough to save itself -- especially when there's billions being spent to convince us that there's no need to change.

The professors teaching Economics 101 still use textbooks based on the old models of "free markets" and "invisible hands" and "unregulated capitalism." The pundits on television got there by insistent assertion, not accuracy, and are paid by industries who got rich on the old system that got us into this mess.

Acquisitive, use-it-up profiteering is tremendously successful as a short-term strategy. Unfortunately, you and I and our grandchildren will bear the consequences.

These economically empowered entities will not scrimp in their effort to make us fear systemic changes. Why should they? It's working for them. They traffic in risks of imminent job loss and damage to the economy, to distract us from the likelihood of economic devastation resulting from a Climate Chaos catastrophe.

For most of us shmoees living paycheck to paycheck, losing a job is far more scary than some distant thing called "climate change." So of course we'll fight for our jobs. And besides, the people calling the alarm are all a bunch of elitist eggheads who don't live in "the real world," right?

The Climate Chaos Decade

We are positing a Climate decade, using mostly pessimistic projections, which contains dramatic "real world" shifts in the underlying bedrock of all natural systems: the climate.

- Ocean levels and, more importantly, storm surges will rise two feet and seven feet, respectively. "Katrinaed" becomes an active verb.
- Significant economic disruption on industries and economies based in coastal areas will affect worldwide economies (as ports are affected by the rising tides).
- The multitude of direct impacts on coastal residents (home values, insurance costs, transportation costs, etc.) will create new kinds of economic refugees -- some "telecommuting" remotely, others having to just up and leave. New "immigrants" to these new low-value, high-infrastructure areas create a new arts scene, themed on transience and impermanence in the world.
- Giant geoengineering efforts are undertaken to cool the atmosphere -- cloud ships, volcano bombing, mirrors in space. We are surprised by the unintended consequences, like Russia accusing the West of causing the drought across its breadbasket, which in fact was caused by our giant cloud ships affecting atmospheric slipstreams. "Oops" doesn't change their nuclear option. (See our "Recovery" chapter, later, for further discussion)

Note to self:
buy
stock in
floaties!



- Coastal infrastructure (sewer systems, bridges, roads, shipping systems, and more) will be occasionally (but catastrophically) disrupted by hurricanes and storms, requiring significant financial outlay and insurance claims, with consequent pass-on to consumers in prices and taxes. That bridge to Galveston? It has to be replaced. The subway system? We have to pump it out. Either that, or actually put subs down there.

Please sir,
may I
have some
more?



- California's traditional bounty will decrease from drought. The midwest's traditional bounty will decrease from heat. Both will ask for more subsidies.
- Ski areas will increase their need for snow-making equipment. "Natural Green skiing" -- going to Canadian ski resorts -- will have a five-year boom.

- Insurance and reinsurance industries recalibrate, creating great economic turmoil, and greater final costs to both businesses and consumers. Insurance becomes deemed "too big to fail," and is underwritten by many national economies.

- New opportunities will be created by the disruptions, and there will be sufficient global capital to provide both seed capital and development capital for energy, infrastructure and societal realignment. Unfortunately, most investment will be private, and consequently will be focused on a ten-year profit horizon, rather than on a hundred-year horizon.

- The Northeast and Northwest passages will be routinely ice-free in the summers, and much of the year. A big boon for shippers!

- Overfishing and a warming ocean will disrupt multiple historically balanced biomes. Overfishing will be rightly blamed, but will be countered by statements that "the cod are huge in Greenland." Very little will be said about the ongoing collapse of phytoplankton.

And where
is Cocco?
Coldcocced!



- Energy will continue to be expensive, yet availability will not drop off precipitously for the 10 year period in question. We will

continue to have “plenty of coal” to fan the flames of global warming. “Clean Coal” continues to be a “just around the corner.”

- A helluva lotta hectares of farmland, especially in the Midwest, China, and Russia, not to mention Africa and South America, will be affected by drought, heat and/or decreases in aquifer replenishment because of lower snow- and rainfall, causing significant economic disruption and much higher food prices, resulting in famine in many areas of the developing world. Nonetheless, Ding-Dongs will still be sold at the 7-11.

Osama bin
there
done that.



- Al-Qaeda and the “war on terrorism” in general are recognized as functionally meaningless, compared to the real crisis. That said, the government “threat level” will consistently vary between orange and red, and corporate media will continue to insist that people be very very afraid of evil terrorists. Comparatively little will be said about corporate responsibility for the increasing climate chaos.

- The Internet, and communications technologies, will continue to grow and prosper, as telecommuting and entertainment help us to forget (or watch incessantly) the predictable and unpredictable chaos going on around the world. Twitter, Facebook, and other social communities will expend countless kilos of CO2 talking the talk.

This scenario is the one best understood by society, but mostly via that “global warming” brand.

“Climate Chaos” is, of course, so much more than that brand, because this fragile skin called “the atmosphere” affects everything else.

Oh, right -- it’s all interrelated!

Like peanut butter and jelly.

And Gilbert and Sullivan.

And Beavis and Butt-head.

And us,
‘Docs
Michael
and Jim.



7. Infectious Disease

(Disease knocks on the door to the clinic.)

'Docs: Who's there?

The really really tiny
steel fist of evolution.

Disease: An infectious disease capable of wiping out a billion people on the planet. Can you guess which I am?

'Docs: Swine flu?

Disease: Too obvious.

'Docs: Ebola.

Disease: Also too obvious.

'Docs: Chikungunya.

Disease: Sounds too much like an item on a drive thru fast food menu.

'Docs: Okay, we give up.

Disease: I'm Lujo!

Lujo bursts into the ApocaDocs clinic. The 'Docs appear unfazed.

'Docs: What is that? A Stephen King novel?

Lujo (formerly "Disease"): You wish!

'Docs: Tell us about yourself.

Lujo: I am a new virus identified just this year!

'Docs: Must you shout so?

Lujo: Yes! I'm from Africa where so many new and exciting viruses are

created! Four out of the five people I infected died!

'Docs: That's a remarkable rate of mortality.

Lujo: Spoken like the true doctors that you aren't. I'm from a family of viruses found in rodents, and I first infected a female travel agent in 2009 in Zambia, who ended up infecting four health care workers, three of whom died!

'Docs: Jeez.

Lujo: I am quite mighty!

Pause

'Docs: So... that was it? Just... four dead?

Lujo: What, that's not enough? More would just be a statistic.

'Docs: Well, sure, but you were talking about being a pandemic that kills, uh, what did you say? A billion people?

Lujo: Perhaps the conditions weren't exactly right for my more aggressive assault on humanity. But no matter. I am also representative of the dangers that lurk in the world of viruses. As population grows, water quality deteriorates, starvation increases, immunity systems grow compromised, invasive species flourish, who knows what will get cooked up!

'Docs: You are a breath of foul air.

Lujo: Thank you! Then when you think about the fermenting biocauldron that is manifest in concentrated animal feeding operations -- CAFOs -- the possibilities are endless!

'Docs: The possibilities for humanity's end are endless.

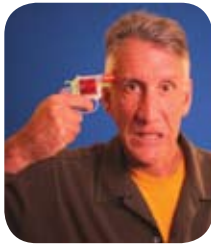
Lujo: I daresay the population could use a little ... ahem ... winnowing. We're inching toward 7 billion humans on the planet.

'Docs: You said that, Lujo; we didn't.

WE HAVE BEEN LIVING, over the last almost-year, under the shadow of a pandemic, and if you've been paying attention, you probably know what might befall our complex systems in a pandemic scenario.

Warning -- the following is not very funny. Some things -- like the known-but-willfully ignored comedy of climate chaos, biology breach or resource depletion -- are obviously tragi-larious, because humans can control them. It's like a banana peel waiting as the silent film star strides purposefully forward... we know he's going to slip, no matter the intent of his stride!

Government...
to the rescue!



The scenarios over which we have much less control -- like a meteor bashing into the earth, a tsunami, a mutated plague, a terrorist-laid virus... these are more gob-smacking than hilarious.

Arguably, we are still far from completing the H1N1 trajectory. Flare-ups and mutants are easy to consider "just around the corner." We 'Docs can

hear the cellos plucking in the background... "Will governments respond in time to get the medicine to enough people? Will there be anti-vaccine propaganda in right-wing clothing driving a third of the vectors from getting the shots? Will our sensible, forward-thinking government prevent a true pandemic?

Unfortunately, that kind of thinking -- that this is a one-time pandemic, that it's a rarity, that it can be fixed -- ignores Chikunguya and malaria and even non-human zoonotic plagues that are beginning to climb into Northern climes. It also ignores the viruses and plagues that will infect our lives directly, without making us sick: the fungus wiping out three-quarters and more of the amphibians it reaches. Will humans be affected by the Irish Potato Famine fungus making a comeback (and wiping out tomatoes along the way?)

Would you like
ranch or
hotsauce with
your
Chikunguya?



We will be troubled by the White Nose Syndrome wiping out hibernating bats, the most efficient mammalian insect predator -- among our best background defenses against insects -- at 90+% fatality rates?

Visualize the Pine Bark Beetle, munching its way through Canada's vast Boreal Forest? How different is a pine bark beetle from an infectious disease?

Is it an infectious attack on humans if it's a secondary infection, like the pollinator collapse that threatens almonds, citrus and apples?

But I
LOVE the
shopping
channel!



Is it an infectious attack on humans, that pod-people have taken over the media and hypnotized us into passivity?

It's clear to at least the ApocaDocs that plague doesn't need to be specific to humanity, but can affect what allows humanity to have a reasonable civilization.

Were some Potato Blight-like fungus to attack the monocrop of King Corn (or King Soy), we'd see devastation not unlike the Black Plague, just as if a H1N1 variant appeared, but with a slower development of more-severe symptoms.

Losing primary pollinators, via infection (or resistance decline), for example, might bugger up about a third of our agriculture. Losing California's bounty (via climate chaos, drought or via overly expensive transportation) endangers Safeways nationwide.

A resource-based plague, however, only pertains to survival-level foodstuffs. The most scary, and most easily envisioned, is a human-contagious plague or viral infection.

Because in a contagious plague, we'd stop going anywhere.

Let us take a step back and make something clear: we are playing roulette with antibiotic resistance. Across the globe, we use antibiotics like we use aspirin, prescribing them immediately, because they can be a wonder drug.

But don't
touch
my Piggly-
Wiggly!



I am pro-
prophylactic!



But we also use them for domestic pigs, chickens, cows, turkeys, fish and sheep. We pump them in “prophylactically” (just in case), and in the feed, and in the water. We do all this knowing that we might just be breeding antibiotic-resistant biota. It’s like we’re intentionally evolving stronger enemies.

Because bacteria can grow many generations in hours. That means that if .00001% of the bacteria survive this round of antibiotics, then they have evolved a genetic resistance, and then they’ll grow to be the dominant strain pretty damn quick.

Why do you think we have Methicillin-Resistant *Staphylococcus Aurelius* (MRSA)? Why do you think that antibiotic-resistant pneumonia is on the rise?

And viruses? Viruses don’t respond to antibiotics, yet doctors worldwide prescribe antibiotics to people with viral infections, thereby evolving resistance of other biotic critters living within their sick systems, while needlessly killing off the good biotic critters.

What happens if a truly severe infectious human disease sweeps the nation? Surprisingly few people have two weeks of food in their cabinets. Fewer still have two weeks of water, much less toilet paper.

If staying home because you’re sick means you’re risking your job, or at least one of your three part-time jobs, and then you can’t make rent or mortgage, well, that makes staying home from work a bit harder, even if you’re in the infectious stage of some disease. If you’re sick or you die, you stop buying from the local shop, who is thus infected by poverty, and stops buying from the distributor, who stops buying from the wholesaler....

Perhaps I can
wipe my arse,
using my
copy of
the magazine
Denial.



We are, alas, a just-in-time society comprised of one- and two-step idiots. We presume we can get tomorrow’s tomato, potato, bean, orange, bean, lettuce, kale, ginger, garlic, avocado, cheese, bread, tortillas, as well as just-in-time post, shipping and haulage, as well as just-in-time delivery of car parts, dryer parts, plumbing parts, drywall parts, roofing parts and far more.

This just-in-time system works extremely efficiently as long as the status quo operates hiccup-free, and has no grit in the gears. Unfortunately, there can be not just grit, but pebbles, even boulders -- whether it be a 14% decline in productivity because of illness, a 35% decline because of disruption in the just-in-time economy (as drivers fall ill), or worse.

In a just-in-time economy, small disruptions in local economies can create huge disruptions in national and global economies.

If the shippers from China, for example, stop making the trip (because they're sick, or they're afraid of a fatal illness), then we have a problem with consumerism. We have (within three weeks) a cascade of dumbfounded aftermarket folks saying "what do you mean, I can't get my Thing-o matic?" Now, we could handle a few weeks of this, but we probably can't handle a few months of cascading disruptions.

I could DIE
without my
cheap crap!



What if the shippers from California won't cross the border for fear of infection, then avocados, oranges and January vegetables become precious and few. What do the produce stockers stock, in thousands of grocery stores...? Conversely, what if all fresh produce might carry the disease?

Or, what if the shippers from Canada can't export the pine 2x4s required for building the few houses still desired by new-home builders...?

Or what if only half as many people as "normal" go to malls, or grocery stores, or barbershops, or airports, or hardware stores, or subways, or buses, or restaurants -- and even those 50% wash their hands vigorously and spray on Purell liberally after visiting...?

These possible situations have obvious implications: a dramatic plunge in the fundamental economy, as layoffs at the lumber yard, the produce departments, the shops small and large lead to economic turmoil. If the pandemic is short and bitter, that's better for business. If it's long and brutal -- months or more -- then our just-in-time economy will rapidly devolve into a survival economy: the bare minimum.

Another
great
band name:
The Bare
Minimum.



There will be no speakeasies, no fetes, no glittering parties that the well-to-do attend. There would be no pockets of frivolity within an otherwise gloomy Depression. Andrew Lloyd Webber musicals would have to be performed by avatars. Digital social networking would spike, while we huddled in our houses.

We would buy our potatoes and beef and eggs from mask-clad grocery clerks; we would be expected to only use a bank card for payment, to avoid the infectious problem of currency; we would hurry home hoping that we could keep our job without having to touch anyone.

Not long after 9-11, when the Washington snipers were taking headshots at people filling up their gas tanks, 'Doc Michael was living in the area. He found himself -- when filling up with gas -- constantly moving, dodging, being sure he wasn't stationary. He knew the chances were tiny that he'd be a target -- statistically as improbable as to be meaningless -- but he wasn't going to "take the chance" needlessly.

Onlookers
just
thought I
had a
touch of
Tourette's.



The same -- but much worse -- would likely be true in a pandemic. We would all be bobbing and weaving, trying to dodge a bullet that probably wouldn't come. If a pathogen was quickly distributed world-wide (and increasing population densities make that very likely), a pandemic would devastate the world economy. Fear is the mind-killer, as someone in the movies once wisely observed.

And if a truly severe infectious disease sweeps our food system or the biosystem?

That
disease is
called
domesticatititis.



We're watching with trepidation a few of these, as you know by now: pollinators, hibernating bats, potatoes and amphibians are falling to fungi. Butterflies and songbirds are declining in tandem. Invasive bark beetles are felling forests. Invasive mollusks and Asian carp and giant jellyfish are taking over lakes and streams and rivers and oceans, wiping out existing interrelationships. Fish farms are spreading disease to the wild fish.

It's the economic disruption of widespread "plagues on presumptions" that we fear most -- plagues on things we just presume will always be there -- that would make this scenario particularly chaotic.

A corn blight? A soybean fungus? Untreatable wheat rust? A rice rot? Very quickly, there's dramatic disruption up and down the agricultural chain, and we get to see how effective Palace guards are at dealing with food riots.

A human plague? Air-transmissible bacterial infection? A slow-mo virus?

Very quickly, there's a dramatic disruption up and down the economy, the society, the community, the neighborhood, and we get to see how effective Neighborhood Watch is when people are both starving AND fearful.

We may find that Neighborhood Watch is unwilling to mobilize just to pick up the dead.

The Infectious Disease Decade

Sometime this decade, we are hypothesizing a human disease with a slow incubation, high transmissibility, and a death rate of 10-30%. This is actually low for many of the possible pathogens. Even at that low level, this sort of pandemic might drive much of the following:

- A dramatic decrease in the use of people-heavy places: airports, malls, workplaces, grocery stores, buses, sports stadiums, you name it -- we'd all be terrified that if we go out of our homes, we'll catch it. "Waving" replaces "Shaking" in polite society. Glovemakers prosper.
- Serious impacts on infrastructure stem from workers calling in sick, or taking paid personal leave: power systems, transportation systems, commercial sales. Most "knowledge work" offices will be fairly barren, for a good long time. The office-coffee distributors go out of business.
- Hospital systems could break down: not enough beds, not enough ability to quarantine, lots of people with damaged immune systems, and worse. Developing

Knuckle protectors make the "fist-bump" safe.



and distributing vaccines or medicines may be troubled, as bottlenecks and a lack of living nurses and doctors may create “viral riots” in some areas. Right-wing radio pundits profess to believe that it’s a conspiracy of some kind.

- Refugees are likely, but entire communities will (like what happened in the Black Plague, or the Great Influenza Epidemic) quarantine themselves, and drive off the desperate, potentially-infected refugees. FedEx delivery? Leave it over in that garage. Domino’s? Fuggedaboudit.
- Economic collapse could quickly follow: international travel/shipping, and even interstate travel/shipping of food and medicine, would be seriously affected. Transporters Sans Frontiers wins a do-gooder award.
- National panics (imagine Fox or CNN’s breathless treatment of a new plague) could quickly create hoarding, violence, estrangement and other desperate, counterproductive measures.
- Internet use, where network systems are able to be maintained by telecommuting or clean-room-ensconced systems administrators, becomes vital to survival. However, vast areas of the Web go dark, as key figures succumb.
- Massive deaths would create new horrors and health issues. Rotting bodies are left where they fall.

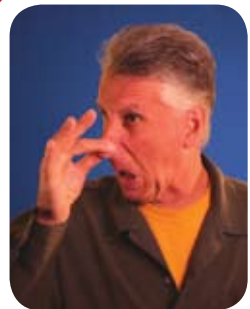
Note to self:
Buy stock in
companies who
own the rights to
zombie flicks.



- Cities quickly become uninhabitable, at least for a few months, though these population centers will likely get any vaccines or medicines early.
- Order and rule of law collapses, worldwide, for a dark period of a year or more.

Kinda ugly, isn’t it. We almost didn’t include the scenario, because of that “not really in our control” deal. Oh yeah, and that “rotting bodies left where they fall” part.

But we realized that the scenario worked as a sort of psychic precursor to the next phase of our journey. Sort of toughen you up for the Big Ugly, which is up next.



APOCADOE WARNING

Sorry, dear reader. We must now go down the final, darkest, worst scenario of all. You have to do this, if you've come this far. Don't avert your eyes. We all have to understand the death spiral of Converging Emergencies -- the Great Unravelling -- to be able to plan for these eventualities.

And guess what -- after the next section, we can talk about Recovery (Whew!), a much more pleasant (though perhaps just as difficult) undertaking.

8. The converging emergencies

(Knock on the ApocaDocs Clinic door.)

'Docs: Yes, who is there?

Knocker: You don't want to know.

'Docs: Of course we want to know.

Knocker: I'm your scariest visitor yet.

'Docs: Sort of the Ghost of Christmas Future kind of thing?

Knocker: In a way, Tiny Jim and Michael. (laughs) By definition all your visitors in the individual scenarios are just pieces of a larger, more complex and fragile puzzle.

'Docs: "Fragile Puzzle." Good band name.

Knocker: May I come in?

'Docs: We think we can take it.

Enter melting Arctic Sea.

'Docs: Make yourself comfortable, if that's possible.

Arctic Sea: It's not.

'Docs: I'm a little surprised at your identity. Isn't "Global Warming" just part of "Climate Chaos"? I mean, why didn't you show up earlier?

Arctic Sea: I am much more than my ice. I contain legions.

'Docs: Sounds a little pretentious.

Arctic Sea: It's not. Merely portentous.

OMG:
Every*InterThing's*
connected!

'Docs: All right then. Tell us your story.

Arctic Sea: Cue soundtrack. How about Samuel Barber's *Adagio for Strings*.

('Docs frown.)

Arctic Sea: You're right. Too cliché. Let's get on with it. But where to start? And how to end? I am exhibiting the effects of climate change much more quickly and dimensionally than any other area on the planet, but also manifesting biology breach, species collapse, and so much more. I'm the planetary-scale "canary in a coal mine" -- that's me.

'Docs: It's dog days for the canary.

Arctic Sea: Average temperature nine degrees higher than normal. So it's warmer -- a lot warmer. Predictably, the ice is melting. In the summer of 2008 the North Pole was circumnavigable -- for the first time in 125,000 years.

As the ice melts, it deposits fresh water into salty water... not a good mix. Nearly as incompatible as oil and water.

Ice reflects sunlight a lot better than meltwater -- remember the lesson taught by little Cocco and the "albedo effect." So you have warming and melting and more warming and more melting... and then the release of methane stored in permafrost.

'Docs: Warming truly accelerates then.

Arctic Sea: 'Fraid so.

Pause

'Docs: Any more convergences?

Arctic Sea: 'Fraid so. See, this melted water is cold -- and surprisingly, cold water is more inviting to CO2 emissions, and so carbon dioxide is retained more effectively in me, increasing the acidification and making it an even worse day for Cocco.

Deep-water nutrient transfers are thrown off, changing grazing options for ocean life, and massive amounts of freshwater may disrupt “conveyor belts” like the Gulf Stream.

The melting ice also contains contaminants all kinds -- pesticides, heavy metals, particulates, you name it, anything deposited over the last hundred or so years. These toxins just pour out in the meltwater.

Meanwhile, humans will exploit this melted sea and begin commerce across my giant belly, burning even more carbon with their great ships. This newly opened territory will likely give rise to conflict and war, resulting in even more airborne pollution and emissions.

Let us pause while you mingle in your mind the following: salt water, melted ice and glaciers, pesticides, toxins, carbonic acid, methane, soot, blood, and tears.

‘Docs (mulling the mixture): Quite the fatal cocktail.

Arctic Sea: Now let’s layer in the plight of the animals. Only those polar bears with aqualungs, floaties, or pet food will survive. The mollusks will suffer from acidification, struggling to build their shells. Toxins will continue to concentrate in predators: marine mammals are already the most toxic beings on the planet, being filled to bursting with flame retardants, pesticides, phthalates, and mercury. It is difficult to imagine any living thing finding this convergence beneficial to their evolution.

‘Docs: Perhaps the giant jellyfish.

Arctic Sea (ignoring the ‘Docs): And as if this wasn’t enough, all this meltwater raises the level of the sea, worldwide. Got your personal floaties handy?

Pause

‘Docs: Oh Ghost of Apocalyptic Future, is there anything we can do?

Arctic Sea: Read on.

IF YOU'VE GOTTEN THIS FAR through our little tome, you have fortitude. Believe us, we understand what kind of fortitude it requires.

Over the last few years, 'Docs Michael and Jim have gone through periods of deep depression (instant messages like "that story you just posted. Do you sometimes ask 'what's the point'?"); deep cynicism (later turned into a quip on a holyshit-tagged story: "Yeah right, as if humans would ever confront the collapse. We'll just keep on *confirming the theory*"); even fundamental nihilism ("there is no escape from this machine but collapse").

Please be aware that we have moments of radiance and light too -- we'll get to that in a few pages -- but before we go there, we have to talk about the mother-of-all-elephants in the room: the Converging Emergencies.

As you've wandered through the daisies of the last few chapters, you've been making connections, just like we have, in our hair-shirt experience of documenting the converging emergencies.

Because the biggest threat is none of these in particular: it's all of them, even at 20% strength. If, after reading any of the preceding chapters, you said to yourself "these guys are about half right," then think of what that means. Five scenarios, about half right. That's a 250% likelihood of calamity.

If for some chapters you thought pshaw -- only 20% of what they say is true... Five scenarios, about one fifth right. That's about a 100% likelihood of calamity.

And it's even worse than that. You've been reading about Species Collapse, and Biology Breach, and thinking "biology breach is a cause of species collapse -- I mean, dead zones, dams, endocrine disruptors into streams, heavy metals into marine predators... it's both!"

You've been reading Resource Depletion and Climate Chaos and saying, "warming oceans, drought-stricken areas, all decrease productivity, and drought increases aquifer depletion, and if energy is really expensive then even the cost of pumping water will rise..."

Forgive me,
Father, for I
have skin.



You've been making the connections. You've been understanding that it's all interrelated. That we are one big ecosystem, and that humans can disrupt ourselves beyond civilization's ability to fix it.

That's right: it can be worse than any of these collapses, because really it's all of them, even at 20% -- and they each make each other worse.

Gaia is real
and
*man is she
pissed!*



It's time to truly dive into the abyss, even if just for a few moments.

We'll try to keep it entertaining!

Sidebar for the Mathematicians

With five (5) collapse scenarios (and one (1) Recovery scenario), and presuming a compounding feedback relationship between each scenario and two other scenarios of 20%, what's the probability of the shit hitting the fan?

Here's what could happen, during the 2010-2020 decade. We'll use a few specific scenarios as "launchpads of horror":

Emergencies Converging with Species Collapse

- Generalized environmental toxicity creates novel stresses on species up and down the Linnean tree. Plastic in the sea, hormones in the water, fertilizer runoff, chemical stews, pesticides, herbicides, and a thousand other elements dumped into a natural world contain things that Nature never evolved itself to defend against. Unsurprisingly, Nature's resilience passes the tipping point, and it's not just a cold -- it's AIDS, compounded by MS.
- Wild ocean fisheries, increasingly stressed by overfishing and by the shift in salinity, temperatures, temperature gradients, acidity and toxicity of the water, begin a drastic decline

I'm a
Linnean
tree-
hugger!



I'm lovin'
my
fishfarm,
'cause I
love to pet
the fish!



in “productivity” as humans define it. As a 15%-per-annum worldwide catch decline begins to take effect, the price of protein (necessary to feed the fish farms) increases, and the attractiveness of factory fishing increases. McDonald’s invests in a few hundred Filet-o-Farms.

- The birds that have evolved to have their eggs hatch when a particular larva or insect emerge at a particular few weeks in the spring are overwhelmed by shifts in climate and prey. Like already happened in 2009, the chicks literally starve. Imagine that -- times a thousand thousand relationships that have evolved over ten thousand thousand years. These delicate webs are dissolving because of climate chaos. Over a decade, pollination, “pest” population and food webs are disrupted. Consequently, food systems decline, and prices rise, leading to increasing food riots and instability in the late ‘Teens. These high prices affect still legally-mandated “biofuel” initiatives (based on the misguided attempts to produce “green energy,” while still subsidizing industrial farming).

- Functional extinctions happen at an increasing rate, most of them from human actions, and increase in frequency and severity. Biologists, currently mostly mute, may begin to become militant. “Sixth extinction!” they cry. “End of life as we know it!” they shout. “Just a theory!” claim those in power, because climate chaos (and its disruptions) has led to hyperconservative minority government bent on maintaining the status quo.

My problems
ALWAYS go
away the
moment I stop
thinking about
them.



- Plant-based protein rises in price, but unexpected pest plagues (brought on by the collapse of bats, birds and other top insect predators) result in bad crop yields (except in those areas that use severe pesticides, which inevitably result in pest-predator collapses a few years later) -- all of which results in outrageously high costs for the basic element of human life: food. “Eating out” becomes a luxury again, and restaurants worldwide close, along with all aspiring-actor jobs. “Dollar Meals” become only bread and a meatish wafer.

- Explosive infestations of out-of-control organisms -- some benign, some not -- erupt in various parts of the world, as the keystone species (of bird, wasp, vulture, ladybug, raptor, krill, ant) precipitously decline, because some other species upon which they depend has died out. This has unintended consequences on agricultural pests (of plant, animal and insect). New regimens

of fertilizer, pesticides, plantings and emergency seed retention are put in place. The energy needs of these infested areas changes the price dynamics of overall world energy pricing, making it more expensive to move already-expensive vegetables and meat to willing-to-pay markets -- meaning poor areas will sell the food they need to eat and survive, in order to eat and survive. More developing countries will sell rights to their farmlands in order to enrich their Big Men.

If poppa
ain't
fed,
nobody's
fed.



- Vast tracts of forest, farmland and ocean become dead zones, via infestations and species imbalances, not unlike today's Chesapeake Bay -- and the Gulf of Mexico -- and the Boreal Forests -- and the San Francisco Bay -- and the Aral Sea -- and North Sea -- and -- well, and just about every other formerly-rich, formerly-replete, formerly-abundant ecosystem out there. The cause? Warming oceans, warming air, invasive species, decreased resistance from toxins, imbalanced ecosystems and predator collapse. Oh, and that damned invasive species, *Homo sapiens*.
- Agriculture becomes increasingly difficult, especially in large-scale plots, because of large-scale overabundance of specialized crop pests that thinks of acres of monocrops as a conveyor belt of nutrition and procreation. Local, hand-tended agriculture, with hand-fertilized plants of substantial diversity, may begin to sweep the backyards of even suburbia. Every household becomes motivated to grow a quarter-acre of biodiversity. Burpee's Seed is among the few stocks that shows continuous growth.
- Bacterial, viral and microbiotic species will seek new arenas for survival, which will likely include sparking new diseases and antibiotic and antiviral-resistant infections, affecting the already-weakened immune systems of most vertebrate and invertebrate species. (Note: this is distinct from the Infectious Disease Scenario described elsewhere.) Because their host species has collapsed, microbes evolve into new host species, including humans, but also including other profligate species. Because of biology breach, resistance is not just weak, but futile.

Whew! That was a cold shower!

But not outside the conceivable, eh? Knowing what you know, it could go that way.

Of course, it could go differently:

Emergencies Converging with Climate Change

- We see an increase of dramatic coastal events such as record tides, hurricanes, tidal waves and red tides; these affect oil rigs, which affects oil prices; this increases oil profitability, encouraging Canada's Tar Sands and other high-energy production of oil production, creating a social feedback for producing excess CO2.

- Drought and deluge conditions disrupt areas of the world accustomed to neither; we see this in Kenya, in Malawi, in India, in Indonesia, in China, in California. Hunger, migrants and transportation disruptions begin to have reality shows on Fox.

Survivor:
Everywhere!



- Significant changes occur in prevailing temperatures, winds, and currents, because of changing temperature gradients; these have a significant effect on corals, migrating fish and phytoplankton. Disney brings out a virtual reality environment called "Ocean II".

- Earlier springs and later autumns across the northern breadbaskets begin, which throws off the breeding/feeding habits of many specific species; breeding declines 20% annually because some specialized maggot comes out two weeks too late to feed the specialized songbird chicks. Several areas have "The Year Without Winter" by mid-decade.

The 2018 Winter
Olympics include
cross-country
mudskiing.

- Increased melt-off of Greenland and the Arctic flows massive fresh water into a fundamentally salt-water system much faster than expected; the salt-requiring species are damaged throughout the Arctic and Antarctic oceans, ripping the food web in those regions to shreds. The WWF provides polar bears waterwings, aqualungs and floating rafts whenever possible.

- Disrupted transoceanic shipping (by frequent extreme weather, rising tides, increased oil costs and decreased volume) becomes 20-40% more expensive. Even the savings from using the Northeast and Northwest Passages doesn't make up for that.

- Methane releases of massive proportions from now-rotting post-permafrost exacerbate the greenhouse effect, and ensure that we will have a 4 to 6 degree rise in our lifetimes, unless rapid changes are implemented. The scientific consensus is unmistakable. Senator Inhofe continues to assert that the science is still "unsettled."

- Among the congnoscenti, the future looks unremittingly bleak, and many try to cash out. Stocks and bonds crash, while inflation skyrockets; oil futures drop for 6 months (based on decreased energy use by a poverty-fearing world population), before peak oil is recognized (again) and the price of oil spikes (again). The extra methane (which has "only" an 18-month halflife) spikes warming over a three-year period, exacerbating the ocean's deterioration. Even the Dollar Store is looking too expensive to a lot of people. The economy, based on promises of endless growth, is shown to actually have no clothes.

Note to self:
Start the
Half-Dollar
Store.



- We see broad-spectrum political upheaval, because the populace "gets it," while the moneyed interests controlling the media and the governments struggle to maintain their lucrative status quo -- through denial, halfmeasures, and delaying tactics. Radical (and sensible) new parties rise, but such awareness is only the minority, so they siphon off support -- money and energy -- from the left wing, worldwide. Consequently, roads are still opened in wildernesses, corporate responsibility for climate change is legislatively put "in the past," carbon legislation is held up "in the interests of maintaining an economy," and millions of species are consequently wiped out over the succeeding five years. Drought and aquifer depletion, and better general understanding of just how depleted things were made by the moneyed elite creates fertile soil for radicalism: Libert , Fraternit , Ecologie!

- An increasing population of "telecommuting refugees" (among first-world nations) and "teeming refugees" (among developing nations) move inland from the coasts, as the oceans rise. As drought, species collapse (see below), and access to foodstuffs change the

Nothin'
tastier
than a
capybara
on a spit.



equation, bushmeat and airmeat and sewermeat – that last bastion of the hunter -- becomes a standard commodity among many in the Second, Third and yes, First world. This results in annual decimation (10%) of the last remaining outposts of most big-bodied species, whether deer, or beaver, or wildebeest, or gorilla, or capybara.

- Catastrophic insurance, and the reinsurance industry itself, has a crisis of liquidity, as do multinational banks, retirement funds and other large financial organs deeply invested in the status quo, including foundations trying to save the world, since their endowments are wrapped up in stocks, bonds and hedge funds. It also affects the ability of those donors to try to save the “ferfuffled marmot,” which means that its last available territory becomes a biofuel palm oil plantation.

Ouch! Sleep on a bed of nails much? What kind of masochists are we, thinking stuff like that?

Is there a word like “masorealists”? Empirimasochists? Maso-empiricists?

Or maybe just “ApocaDocs.” It’s what we do.

Emergencies Converging with Resource Depletion

- When humans reach the Peak Oil tipping point, then the cost of energy begins to inevitably rise dramatically, rapidly and chaotically over the next decade. For our modern society, when oil hits \$150 to \$200/barrel (or \$7-\$12/ gallon), then many aspects of our energy-intensive society become exceedingly costly, not least among them: dealing with climate change, dealing with desperate nations, dealing with dramatic economic disparity between energy-rich and energy-poor nations, dealing with waiting in the drive-thru lane. Focus is put on economic stability, border security, and “energy security” (read: coal), instead of on saving the planet’s ecosystem - because cheap energy fuels the next quarterly corporate report.

Wait!
There’s
more!



- With the destructive wrath Climate Chaos hitting the coastal zones disproportionately, the need for steel, concrete, aluminum, as well as other

construction supplies, will skyrocket -- all of which are oil- and energy-intensive activities. So will the costs for all of them. This increases the economic driver of immediate sustainability over long-term sustainability, meaning that coal and other climate-forcing energy systems become economically attractive, because the raw cost of other energy forms (oil in particular) is so high. Heavy metals never tasted so good.

- The suburban lifestyle of an hour-long commute each way becomes gradually untenable. Those \$700,000 mini-mansions far away from public transportation, with their poor insulation and high ceilings, not to mention their toxic drywall, plummet in value, leaving even the upper middle class of North America with negative equity. Climate Chaos is also decreasing the value of coastal properties (the "second home" of the well-to-do). These nouveau-pouevre get grumpy about "climate change reduction taxes," resulting in a ten-year delay in serious political will, resulting in a dramatic species decline as climate chaos and biology breach wipes out, in their various ways, whole ecosystems. Carpooling, however, will be organized via an iPhone app.

Carpooling,
like
taking the
bus,
is for *losers!*



- Mountain glacier and snow melt-off, upon which billions of people depend for drinking water, gives up the ghost, since it's not been replenished in years. Underground aquifers have become tainted with chemicals, pesticides, natural-gas "frac" fluids and more, all of which take increasing energy to purify. Water wars break out like acne across Africa, Asia and the US Southwest. Wyoming, Colorado, Utah and New Mexico tagteam against California to prevent "their" water from being piped to irrigate wine grapes. Schemes to build a pipeline from Lake Michigan to Las Vegas are given up when the entry points are clogged with Quagga mussels.

- Toward the end of the decade, all transported commodities cost two to three times as much to transport from place to place -- food, medicine, clothes, tools, etc. -- in fact, everything. Bushmeat trade increases; local "greymarket" local-food bartering economies mean fewer taxed trade (and fewer tax revenues); black markets on prohibited pesticides, herbicides and fertilizers abound.

Hey, you,
c'mere... yeah,
you. How'd
you like to buy
some *good*
shit?

- China, Russia, and the US all burn the cheapest energy source -- coal -- for raw energy, adding carbon to the atmosphere, exacerbating Climate Change and Species Collapse and Biology Breach, in an effort to maintain their economies. All scenarios are exacerbated.

- All oil-derived commodities (fertilizers, pesticides, plastics, herbicides, steel, corn syrup, soy production, etc.) double to triple in basic costs, affecting all industries dependant upon them. Even styrofoam doubles in cost.
- These higher transportation and production costs raise the projected and actual costs of nearly all remediation projects, radically decreasing the political will (and the tax base) to address the effects of:
 - environmental dead zones
 - migrations and refugees
 - overwhelmed medical and public health systems
 - rising oceans
 - collapsing financial systems
 - collapsing insurance systems
 - collapsing agricultural systems
 - collapsing employment systems
 - collapsing environmental systems
 -

Hard to believe the above are just three of the five collapse scenarios converging. And we let you off light! We didn't even much include the likelihoods of antibiotic overuse in a desperately sickening and poor population (increasing the likelihood of antibiotic-resistant plagues); or the shift in malaria from equatorial to northern climes in a climate-chaos world; or bearing the full weight of "Biology Breach," though certainly that should be included in the mix. And we didn't address the continent-sized gumbos of plastic, did we?



The problem is, people cry foul when the entirety is presented as an interconnected set of emergencies. "No way we'd let it get that bad," we hear said. "They'd fix the problem if it went that far," we hear elsewhere.

But "they" don't exist, and that "that far" is what we're seeing: institutional obliviousness, shortsighted corporate strategy, small-business myopia and continuous consumer hunger. Nobody's willing to sacrifice now (with a little disruption) to prevent chaotic disruption later.

I guess that
makes me a
half-step
idiot.



Unfortunately, if we aren't shifting our society in ways that will be disruptive, then we aren't shifting enough. That statement bears bolding, because it indicates how hard the transition will be.

The direction we're headed now is effing suicidal. We are flooring it toward the abyss. Things fall apart, the center cannot hold. We're feeding tinder to the flames. We're cursing God as we're being thrust down to Hell. We're drinking our way out of alcoholism, smoking our way out of nicotine addiction. We're spiraling our way out of a fractal system.

We're doing it to ourselves. What a hoot! How tragicomic! How absurd!

The likelihood of converging emergencies is, we're afraid, much higher than the likelihood of any mere single scenario's scenario.

Given that we are multiply screwing ourselves, what is our moral imperative?

To work like hell to change the status quo.

9. The Recovery Scenario

Congratulations! You made it this far. Past the individual scenarios of biological collapse. Past the “Converging Emergencies” chapter -- a chapter we affectionately call the “We’re Clusterf*\$%ed” Scenario.

So. Now what?

This time, Earth is not the patient; nor is the Yangtze River dolphin or the glacier or the superbug.

This time, the patient is you.

Us.

We will tell you straight, like any good doctors -- faux or real -- would do.

The magnitude of the bad news is on a scale far beyond the good news.

It doesn’t add up, except to habitat collapse and inevitable subsequent chaos.

But what’s the alternative? If you’re the kind of person who’s reading this book, then you’re unlikely to just bag it, and get in your Hummer and not brake for endangered species. You want to do something. Act. Even if the odds are against you. You have family, friends, a community you enjoy, a planet you want to survive as a good place for humans to continue evolving. The psychology of despair doesn’t cut the mustard.

So our job -- beyond telling the truth about our collective malady -- is to help with the collective recovery. Because we’re going through the same psychological process.

What we won’t do is tell you what kind of lightbulbs to use or that you should install a low-flow toilet, or whatever. There are plenty of resources for that kind of thing -- of which you are doubtless already aware.

What we will do is two-fold.

One, share with you some exciting INNOVATIONS -- in thinking, in technology,

in perspective - that might make a difference.

Two, approach this “recovery” possibility from the aspect of human behavioral change with REAL SOLUTIONS that could change the dynamic.

INNOVATIONS

It’s probably clear by now that the ApocaDocs are not “technology will save us” kind of dudes.

You’ll hear, in the years ahead, a growing chorus for “geoengineering solutions,” the hubristic notion that we can construct world-scale earth-changing contraptions, consequence-free. We can create cloud-belching ships, or send up sparkly mirrors to reflect away sun, or drop bombs into volcanoes to belch smoke, or build nuclear plants to power carbon-sequestration schemes that pump CO2 into the now-emptied oilfields.

Sounds like a lot of fun! And great fodder for a movie. And a way for a few megacorporations to make a whole lot of money!

The ‘Docs think this bad set of ideas will allow humans to pretend that we are still in control. These schemes will propagate the fundamental craziness that got us into this mess in the first place -- and will keep those who perpetrated it firmly in control.

Deep Impact
Day After
Armageddon!



Abusive parents do not deserve the return of their family, do they? If a guide left you lost in a treeless plain of sticker-bushes, would you hire him again?

Of course not! So why should we believe that the purveyors and profiteers of the status quo will have the answer?

Hubris, you may remember from your high-school Greek Mythology, is “overweening pride and arrogance.” Generally, in those myths (and in modern legends), the gods smack down any overweening weenie who thinks he’s as a god: Icarus plunges, Victor Frankenstein is crushed, Doctor Faustus pays with his soul. Prometheus has his liver eaten daily by an eagle.

Unfortunately, geoengineering is not just hubristic, but is also, alas, incredibly stupid. It is masking single symptoms, not addressing the disease.

It is a toxic band-aid that prevents the wound from healing.

What did we learn in the Convergence chapter? That it's all interconnected.

You can't do one thing (say, artificially overfertilizing and spraying pesticides on crops for decades) without it affecting other things (eventually, downriver, overfertilizing algae and creating oxygen-free dead zones the size of small countries in the ocean). When we do some large-scale altering, like increasing the CO₂ level of the atmosphere 25% over 100 years, there are unintended consequences. That's why we're in this hole.

Is it not madness to think that there won't be massive unintended consequences from trillions of sparkly nanobots in the atmosphere? We often can't even get the little things right, like introducing cane toads into the Australian ecosystem to eat the sugar cane grubs. Isn't it likely that billions of clouds pumped from cloudships will not just cool the atmosphere, but reshape the patterns of warming and cooling? Remember earlier in the book, when we talked about Russia or China getting a little testy about their agriculture being wiped out by climate manipulation?

Humans simply do not understand climate patterns well enough -- especially in a disrupted world -- to choreograph it with new amateur ballerinas.

Someone will say "But computer models...", to which we say "look how well our models have done with the converging emergencies."

Take two
hubrii and
call me in
the morning.



We play doctors on
a Web site, but don't
pretend to be
meteorologists, or
choreographers.

The people proposing these plans are well-meaning savants. They tend to be engineers trained to build solutions; economists trained to presume that endless growth is not just possible, but a human right; technocrats trained to propagate the existing worldview; and politicians pandering to their funding base.

The ApocaDocs have yet to see prominent life scientists propose a geoengineering solution, probably because biologists have been trained in ecosystem interrelationships, and so think a few steps further down Implication Road.

So let's put world-scale geoengineering back into its sciencefiction blockbuster hubris-box, and move on to what kinds of innovations ARE making a difference, on a smaller, community scale. Added up, they may not even begin to approach the larger system solution shift needed, but hey, it's fun and kind of funny to see what we crazy humans can come up with!

**Pocket Jaws of Life!
Bad-breathalyzer!
Gadflypaper!**

REAL SOLUTIONS

How did we get to this place, where each and every little thing now seems gargantuan, one more inevitable, inescapable, incremental step toward the Apocalypse? It's like a game of chess, where every move elicits the response Checkmate! from your Four Horsemen opponents. Or like those Chinese finger puzzles, where the harder you pull, the more tightly it traps.

**We have painted
ourselves into an
ApocaCorner.**

We need to shift the game altogether. It's not about thinking outside the box, it's about throwing out the tired, old metaphor of "the box" (and the metaphoric "envelope-push," along with it). Instead, we must be re-imagining how humans can behave.

We know a couple of important things.

People are capable of change. Human history is replete with examples.

People behave better if they know they are being watched by good-behaving peers (you rebels and those afflicted with Oppositional Defiant Disorder notwithstanding). Studies confirm this reality.

So, if people can change, and if they see others behaving differently (i.e. for the earth, not against it), a momentum could begin that might -- just might -- begin to tip the scale.

Now that's a tipping point I can get behind!

Clearly, we have to shift to a more humble, efficient, slowed-down and locally-oriented society/community. Engineer change to an attitude of integration with our natural world, not domination of it. Engineer change toward steady-state economies, sustainable systems, and conscious recovery.

Trust us,
we're not
experts!



The ApocaDocs aren't experts (or doctors! or scientists!) in making this change -- nor are we experts in designing it. But then again, nobody is an expert -- and certainly not those serial abusers currently in charge!

Al Gore's ten-year time frame for shifting away from coal seems just barely possible, and allows people planning time to shift into other industries. A decade of warning lets big money (those old fossil fools) know what kind of time horizon they're working with -- they can either get with us or get left behind -- and not left behind that Rapture kind of way.

Our approach is to envision a viable, recovered future, and then try to backtrack to what could make that happen.

What would a sensible, recovered future world to look like in ten years?

- Everyone fed, and healthy, and free to bitch about healthcare and the economy.
- Far fewer very-rich, and far fewer very-poor, but inevitably, some of both. Each should be somewhat shameful, as indicators of laziness or greed, respectively.
- Oil, coal, and gas used as little as possible, and only for necessary, relatively permanent production (as opposed to powering temporary, disposable, momentary, or superfluous production).
- Plastic used only when it's required, and never for one-time use.

- Much less travel; much more telecommuting; much more “virtual presence” meetings.
- More time spent with friends, family, and neighbors; much less time spent acquiring disposable crap. But still, great parties!
- A standard of living defined by quality of life, not quantity of possessions.
- Slower food, slower sex, slower satisfaction, slower destruction.
- A presumption of recycling, and composting, and avoidance of waste, as a social responsibility.
- Localized power generation, with each household and building feeding a larger grid, so we all have guilt-free energy.
- A recognition that we have several more decades of repair work and belt-tightening, in exchange for forgiveness by our grandchildren for what we did to their world.
- Forests, wilderness, oceans, lakes, streams, and parks stabilized, with flourishing wildlife.
- Ancient anything, recognized as a finite, precious resource worthy of protection: e.g. ancient water (nearly all aquifers), ancient energy (oil, coal, natural gas), ancient forests, even ancient cultures.

How do we get to that 2020 where things are survivable, equitable, and sane? We ‘Docs envision ten years of sometimes radical, sometimes wrong, sometimes inefficient, sometimes brilliant shifts from the status quo. A decade of sacrifice and altruism and cooperation is required.

Here are some examples of how we might get there:

Ecosystem Recovery Engineering

Empower people by funding Green Jobs worldwide for forest planting, watershed care, energy-efficiency advice and implementation, lawn restructuring, backyard gardening, and much more. Employ people in energy

efficiency retrofitting. Invest in water purification technologies, toxin abatement, and invasive species culling. Pay people to guard biodiversity hotspots from bushmeat hunters, wildcat potato growers, illegal rainforest destroyers, palm oil producers, etc. Subsidize organic farmers simply because of what they don't spray pesticides, herbicides, and chemical fertilizers into our environment. These are lots cheaper than bailing out the banks – or invading a couple of countries!

Economic Engineering

Implement a sensible CO2 tax (we 'Docs like James Hansen's monthly carbon-tax-rebate check -- but one way or another, we must produce disincentives for destruction and incentives for efficiency). Perhaps extract Tobin taxes -- tiny fees on international bank transfers -- to fund millions of green jobs.

Gradually increase toxin taxes for lifecycle damage, at the factories. Develop a new metric: the True Cost of every product -- not just the energy cost to produce and maintain, but the environmental cost of disposal, the lifecycle toxins generated, even likely human rights abuses, as a True Cost as well as a True Cost Tax. Have the True Cost fees go directly toward addressing the damage.

Honestly, how crazy is it that the huge profit from, say, a sale of a pair of athletic shoes (when they use subsistence-pay Chinese peasants in toxic-glue workplaces, using dirty coal for its power), produces lots of money to advertise a product that then is shipped from Shinjuen to Shanghai to LA to Kansas City to a foot in Lawrence, Kansas? The whole process is filthy with carbon and toxins, and nobody has any business disincentives! Is this rational to allow? What madness, that we pay for this shit to continue!

Whoops... sorry, sorry, going a bit over the top for a 'Doc. We're supposed to be dispassionate. But as we are writing this short book more is happening. For example, there's some clear evidence that the Arctic is disappearing faster than the worst predictions of the most pessimistic models from the IPCC. Recent work now indicates that "tipping points" usually happen without warning -- and look how well we've been doing while being warned. If the 'Docs had a dollar for every time "faster than expected" themes showed up in our stories, we'd buy a solar panel. So we're a little, um, passionate about this.

State clearly that no coal plant can release CO2 or heavy metals after 2020, thereby allowing a rational shift that treats miners, drillers, and associated

industries with respect, but also encourages coal-industry investment in clean coal technologies. Regardless, it must be a short time scale, and it must be binding. Call it the visible hand of the enviroplace.

Energy Engineering

Pump subsidies and funding into small- and large-scale solar, wind, and geothermal energy, and build a smart world grid. Subsidize any energy source that does not pump out CO₂, from anywhere. Heavily fund research into all energy options. If you bottle lightning, we'll pay you for it. Consider small-scale nuclear, if it can be done safely and rapidly. Maybe we'll see some serious innovation that is a game-changer for energy (algae-whiz!), which would be sweet -- but of course, isn't sufficient, nor can we plan as if it'll happen.

If we can imagine and seriously consider stupendously expensive (in cost and unintended consequences) geoengineering schemes, then why can't we plan out a World Energy Grid? Also at stupendous cost, but with stupendously wondrous consequences. Daytime wind and solar energy in Africa can power North America at night, and the same is true in reverse. Honestly: we could figure out, in five years, how to build a worldwide energy network, and implement it in the next five. All it takes is will. But uh-oh: bureaucracy ahead.

CO₂ Engineering

Massive, centralized CO₂ sequestration is a dream cloaked in a hope, promoted by credulous fools or manipulators. It is as real as "clean coal." The only possibility for massive CO₂ sequestration is massive but localized small-scale sequestration, world-wide. Enriching land with biochar -- churning charcoal into soil -- is probably the best option for this worldwide effort, but other options are possible. We need small- and large-scale biochar subsidies, as well as for green fertilizer, green roof farms, industrial extraction (powered by solar and wind power), and carbon storage. We could fund it via some international monetary tax like the Tobin tax -- as well as from carbon-tax interest, from toxin taxes, from insurance fees... who knows.

All we have to do is make it a priority.

The basic fundamental engineering effort, though, has to be in social engineering: i.e. how to shift human behavior away from overconsumption and overpopulation.

How to transform fear into a desire for change.

Hey kids,
let's
put on a
show!



Social Engineering

In early September 2009, Paul Ehrlich and a bunch of colleagues from Stanford launched the Millennium Assessment of Human Behavior (MAHB), which attempts to gather up a number of the planet's emergencies into one initiative toward change. You might call it a "converging solutions" approach -- to tackle the converging emergencies, be they overpopulation, climate change, food and water insecurity, pollution and overconsumption and overdevelopment. They are all tied together, of course, so why not face 'em en masse?

You have to figure, too, that someone like Paul Ehrlich, having touted human behavioral change for forty years -- and seen little to no progress -- is either ready to surrender to apocalyptic certainty, or try for the whole hog solution. MAHB's mission is to "encourage a global discussion about what human goals should be (i.e., "what people are for") and examine how cultural change can be steered toward creation of a sustainable society."

We love that: "what people are for"... We could at this juncture pretty easily conjecture that people "are for" reproducing themselves, emitting carbons and generally bugging up their habitat to the point of flirting with not only their own personal apocalypse (duh, death), but also taking the whole darn thing down with them.

**But shopping
is my life!**

But people CAN decide they "are for" something else. Say, for saving the planet or quality of life or sustainability. We can make it up; nobody is stopping us. When a president tells us to go shop at the mall, we don't have to obey.

Remember, if we aren't shifting our society in ways that will be disruptive, then we aren't shifting enough.

Here are some real-life examples of such shifts:

Zeros rule!

Here's a story from Scientific American about triple-zero buildings: that is, zero emissions, zero waste and zero energy consumed. All that nothing sure adds up to something! It's just the latest building constructed by Werner Sobek, whose most recent edifice, a four-story glass modern house, actually produces more energy than it uses. Wow! That's worth a look (but don't be a Peeping Tom about it). [www.tinyurl.com/22uc747]

Ehrlich your lips.

We loved this headline in the Washington Post: When It Comes to Pollution, Less (Kids) May Be More. Now there's an innovation EVERYONE can embrace (okay, not everyone... and be careful because those "embraces" can lead to... well, you know...): STOP REPRODUCING, dudes and dudettes! We know that overpopulation is key to this ApocaPickle we're in, so why not use some family planning technology and have fewer kids -- or maybe, just maybe, not have any at all. And while we don't want all those birth control chemicals in the ground water and condoms littering the countryside, they are miniscule consequences when compared to other solutions. [www.tinyurl.com/26q4f83]

Be fruitful,
but
DON'T
multiply.



Green sheep make prettier sweaters.

Scientists at the Sheep Cooperative Research Council in Australia are studying sheep to identify a genetic link that causes some sheep to belch less than others. Burping, you see, produces far more emissions than does farting. So, the scientists are hoping to breed sheep that burp less, so we have less methane. Don't you just LOVE the Pre-Apocalypse??? [www.tinyurl.com/2ab5ueo]

Showdown at the OK Corral.

Indigenous natives in the Amazon traveled to the town of Salvacion (could this story get any cooler?) to forcibly remove the Hunt Oil company (Texas-based) from their land. Peruvian police were of course on the side of government and big-business and oil and were awaiting the natives, who claimed they would defend their tribal lands with their lives. [www.tinyurl.com/27qd9jk]

Life-cycle labeling.

This little ditty of an innovation comes from none other than Wal-Mart. The Dick Cheney of the big box consumer world, developed a labeling process that will provide a nearly “True Cost” assessment for every product they sell. A kind of cradleto- grave, start-to-finish, panoramic accounting. It increases the greentelligence of the consumer.

[www.tinyurl.com/2fj8z4u]

Cool words CAN
save the planet!

Old school farming.

Bolivian farmers are using ancient farming techniques regarding irrigation to provide protection from climate change and improve food security. These kinds of recovery stories can often be found our site. We kind of feel like duh! about it, but hey, every time somebody figures out the “old days” ways of farming still works pretty well, we think it’s worth hawking, um, in a peaceful, nourishing kind of way. [www.tinyurl.com/23495kl]

Sky farms.

The greening of roofs, worldwide, has extended also into what’s known as urban farming. Not only are people turning their buildings’ roofs into carbon sequesterers, they’re growing food as well. A study cited in this article says the number of green roofs grew by more than 35 percent in 2008.

[www.tinyurl.com/2dsdxv9]

Mayor on foot.

Berkeley mayor Tom Bates gave up on cars altogether, instead opting for walking and mass transit. Now, that ain’t the hardest thing to do in Berkeley, with its fast and efficient BART. Still, you gotta love this setting-by-example behavior of a politician. [www.tinyurl.com/23orzj3]

Plus, it gives him a
great excuse to never
be on time.

Dude, where’s my house?

A University of Bath study concluded that “Hemp Could be Key to Zero-carbon Houses,” a story that provided endless punning possibilities, if we weren’t too high to think of any. Kidding! Hemp won’t get you high unless you smoke so much it makes you dizzy. We’ve tried. Hasn’t hemp always been one of those “if only” type solutions? This fast growing weed could be (and is) made into paper, clothing, now houses. [www.tinyurl.com/29b66wu]

Best headline of 2009

“Bug eats electricity, farts biogas” -- This story described an intriguing idea of feeding surplus power to microorganisms, that would combine it with carbon dioxide to create methane that could be stored and burned as needed. Whatever! Any headline with the word “farts” is a winner in our book.

[www.tinyurl.com/2bpwc4a]

If they can do it...

An entire city switched to biofuels. Okay, it was in Sweden, and we aren't exactly in love with biofuels (and nuclear energy), but it proved that human behavior can change on a rather grand scale (see next section) so we thought this worth highlighting. Plus, anything mentioning Sweden is always an opportunity to quip about sex (but not reproduction!) or Bergman or both.

[www.tinyurl.com/272qjog]

Green death to die for.

Although we firmly believe not being conceived at all is arguably the greenest thing one can do for the earth, a bio-cremation process using a chemical body-disposal process with alkaline hydrolysis, burns one tenth of the natural gas of a fire-based cremation and one-third the electricity. And no mercury escapes, a real plus! [www.tinyurl.com/2ej56b7]

These ideas lead us to our final pitch, a decade we are calling:

PEOPLE RISE UP

“Rising up” isn't just about personal choices -- though that's really important -- it's also about rising up and asserting our priorities. Not priorities like it's my right to use a leafblower, but priorities like it's my right to have a future world I recognize.

Listen: We buy everything in this economy, therefore we own the economy, if we choose to believe it. By our purchasing decisions, as well as by our activism, and most directly, by our individual actions, there are a thousand ways in which we can change the world.

We can choose to repair instead of throw out and buy new. We can learn to re-upholster, to glue, to make things last. We can darn socks, and wash only what is dirty. We can choose to have a potluck instead of going out to eat. We can buy

from local stores stocking local produce, instead of huge chains whose economies of scale dictate mass farming. We can make frugality something to be praised again.

If you don't want something in your neighborhood, Just Say No. Plastic bags, water bottles, cellphones, television, whatever that thing is that is poisoning or tearing your world apart, get rid of it. Educate those around you about why it matters. Speak up about it. Militate against it.

Here's a town that voted to make pesticides illegal. [www.tinyurl.com/2g8gzjh]

Here's folks in coal country not waiting for the Obama administration to come to their rescue. Instead they are forming their own powerful activist group whose aim is to stop mountaintop removal once and for all.

[www.tinyurl.com/2fa3obv]

Here's an entire town in Australia that banned plastic water bottles.

[www.tinyurl.com/27b9hc6]

People are rising up everywhere.

The entire country of Ecuador re-wrote their Constitution in October, 2008, to hold the rights of nature transcendent over corporations. Two-thirds of Ecuador's citizens voted to approve this new Constitution, which includes a set of unprecedented articles that guarantee 'inalienable rights to nature'.

[www.tinyurl.com/26ruo34]

This was huge. Let's repeat it: the guarantee of 'inalienable rights of nature.'

Ecuadorians were aided in this Constitutional change by a man named Thomas Linzey, who heads of the Pennsylvania-based Community Environmental Legal Defense Fund, otherwise known as Democracy School. 'Doc Jim went to Democracy School and learned how people can rise up to take back their lands from the fossil fuel fossils.

Transition Towns is another gigantic effort taking profound shape -- a strategy of facing Peak Oil and Climate Chaos on a community-to-community basis, by drawing all members of the community into the conversation. TT folks caution: "Transition is a social experiment on a massive scale."

But compared to the unregulated, unrecognized, uncontrolled experiment that humans have been running on the biosphere for the last few hundred years, “transition” is much less scary -- because it’s social, not ecocidal.

Initiatives like Transition Towns and Democracy School and communities saying no to bottled water are springing up throughout the globe.

There was no better example of that than 350.org’s International Day of Climate Action on Oct. 24, 2009. Despite -- and because of -- the fact we’ve gone far beyond 350 ppm of CO₂ (we’re now hitting 390 ppm), everyday people from 182 countries engaged in 5200+ actions displaying the number 350 in a variety of creative, fun ways. CNN called it the “most widespread day of political action in the planet’s history.” To us ‘Docs it was made manifest that we can be one planet, united for our own survival.

Then, they turned around and did it again.

While world leaders were having a bitchfest in Copenhagen, 350.org folks marched, shouted, lit candles, gathered in great numbers there -- and across the planet.



So join them.

Or join another group.

Or form your own.

Whatever you do, join the earth, unite with all its organic life. And rise up. Make a stand.

Let us recognize the fundamental truth that we make it all up, and we can do it differently.

10. EPILOGUE

What world will we get in ten years? It's hard to tell. The army of stupid standing in our way will be marshalled and led by champions of the status quo. They will resist, passionately, any change whatsoever.

The status quo owns the media. It owns the news, it owns the entertainment. It owns the politicians. The status quo owns the economy.

They don't, however, own us.

If we let them win, we will all lose, of course. Even they will lose, but that will be the poorest revenge.

We have to change the status quo, folks. And fast.

We have to do it for the baiji, for the ocean, for the Earth.

And for little Cocco, too.

So the ApocaDocs hope that you *give this small book to others*. We hope you print out and donate a copy to your library. We hope you talk about this stuff to everyone you know, even when they say "C'mon, if it was that bad, I'd know about it." We hope you Tweet and Facebook about these things, and copy and distribute the digital version far and wide.

We need to make the Converging Emergencies clear to everyone, as fast as we can.

If you've made it this far through the book, we thank you -- now let's get started. We'd say 'let's get to work' but we really mean 'let's get to play'!

We'll be playing and paying attention every day, at www.apocadocs.com, humoring the horror of environmental collapse.

If each human, every day, is working to shift the status quo -- and willing to change it, and live with the change -- then we may have a hope of avoiding the worst of the Converging Emergencies.

Even beyond that, we may have a hope of creating a better, sustainable world, because it may be that to have a sustainable world we must uphold justice, parity, transparency, locality, efficiency, even equality. It may be that the elements of a sustainable world just happen to coincide with those of a better, more balanced world.

Finally, don't take the Converging Emergencies personally. Yeah, we're all at fault. But let's face it, most of us have just been doing what we've been trained to do all our lives: find happiness through consumption. Nobody told us that we couldn't consume forever.

APOCADOCES

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Book Information: Free versions, print on demand, most recent version
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TRUST US, WE'RE NOT EXPERTS!



"... it may be that to have a sustainable world we must uphold justice, parity, transparency, locality, efficiency, even equality.

It may be that the elements of a sustainable world just happen to coincide with those of a better, more balanced world."

The ApocaDoes

"It's [90] pages of face-slapping wake-up call, which begins with a quick summary of Elizabeth Kübler-Ross's five stages of grief, and then dives into an overview of their big themes: Species Collapse, Resource Depletion, Biology Breach, Climate Chaos, Infectious Disease, and Recovery. And a sweeping overview it is.... The book is informative and entertaining, and Desdemona heartily recommends it to anybody who suspects that things are much worse than they ever suspected."

DesdemonaDespair

[M]y emotions are depleted to dangerously low levels, my thoughts are clear-cut and fully de-forested, my mental aquifer has been drained of all reasonable reaction. Their flash-flood of verbiage rips through our policy-barren sociopolitical landscape like crap through an Alaskan Moose loitering on Trans Alaska Pipeline System land..."

Paul Sturm