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## THE WAKE OF INDUSTRIAL CIVILIZATION

IT HAS BEEN MORE THAN FOUR DECADES SINCE SCIENTISTS began warning of the inevitable consequences of trying to pursue limitless economic growth on a finite planet.<sup>1</sup> Since that time, as the limits to growth have become more and more clearly visible on the horizon of our future, a remarkable paradox has unfolded. The closer we get to those limits, the more they impact our daily lives, and the more clearly our current trajectory points toward the brick wall of a difficult future, the less most people in the industrial world seem to be able to imagine any alternative to driving the existing order of things ever onward until the wheels fall off.

This is as true in many corners of the activist community as it is in the most unregenerate of corporate boardrooms. For too many of today's environmentalists, renewable energy isn't something that they ought to produce for themselves, unless they happen to be wealthy enough to afford the rooftop PV systems that have become the latest status symbol in suburban neighborhoods on either coast. It's certainly not something that they ought to conserve. Rather, it's something that utilities and the government are supposed to produce as fast as possible, so that Americans can keep on using three times as much energy per capita as the average European and twenty times as much as the average Chinese.

Such enthusiasm for change that does appear in the activist community by and large focuses on world-changing events of one kind or another. As it happens, though, we have a serious shortage of world-changing events just now. There are good reasons for that, just as there are equally strong, if not equally good, reasons why so many people are pinning all their hopes on a world-changing event of one kind or another. Therapists like to point out that if you always do what you've always done, you'll always get what you've always gotten, and of late it's become a truism (though it's also a truth) that doing the same thing and expecting to get different results is a good working definition of insanity.

The attempt to find some way around that harsh but inescapable logic is the force that drove the prophetic hysteria about 2012 and drives end-of-the-world delusions more generally: if the prospect of changing the way you live terrifies you, but the thought of facing the consequences of the way you live terrifies you just as much, daydreaming that some outside force will come along and change everything for you can be a convenient way to avoid having to think about the future you're making for yourself.<sup>2</sup> Unfortunately, that sort of daydream has become far more common than the sort of constructive action that might actually make a difference.

That hard fact pretty much guarantees a future that is considerably worse than the present, by almost any imaginable definition. The difficulty here is that faith in the prospect of a better future has been so deeply ingrained in all of us that trying to argue against it is a bit like trying to tell a medieval peasant that heaven with all its saints and angels isn't there any more. The hope that tomorrow will be, or can be, or at the very least ought to be, better than today is hardwired into the collective imagination of the modern world. Behind that faith lies the immense inertia of three hundred years of industrial expansion, which cashed in the cheaply accessible fraction of the Earth's fossil fuel reserves for a brief interval of abundance so extreme that garbage collectors in today's America have

access to things that emperors could not get before the Industrial Revolution dawned.

That age of extravagance has profoundly reshaped—in terms of the realities of human life before and after our age, a better word might be “distorted”—the way people nowadays think about nearly anything you care to name. In particular, it has blinded us to the ecological realities that provide the fundamental context to our lives. It’s made nearly all of us think, for example, that unlimited exponential growth is possible, normal, and good, and so even as the disastrous consequences of unlimited exponential growth slam into our society one after another like waves hitting a sand castle, the vast majority of people nowadays still build their visions of the future on the fantasy that problems caused by growth can be solved by still more growth.

The distorted thinking we have inherited from three centuries of unsustainable growth crops up in full force even among many of those who think they’re reacting against it. Activists at every point on the political spectrum have waxed rhetorical for generations about the horrors the future has in store, to be sure, but they always offer a way out—the adoption of whatever agenda they happen to be promoting—and it leads straight to a bright new tomorrow in which the hard limits of the present somehow no longer seem to apply. (Take away the shopworn trope of “the only way to rescue a better future from the jaws of imminent disaster” from today’s activist rhetoric, for that matter, and in most cases there’s very little left.)

Still, the bright new tomorrow we’ve all been promised is not going to arrive. This is the bad news brought to us by the unfolding collision between industrial society and the unyielding limits of the planetary biosphere. Peak oil, global warming, and all the other crises gathering around the world are all manifestations of a single root cause: the impossibility of infinite growth on a finite planet. They are warning signals telling us that we have gone into full-blown overshoot—the state, familiar to ecologists, in which a

species outruns the resource base that supports it<sup>3</sup>—and they tell us also that growth is not merely going to stop; it's going to reverse, and that reversal will continue until our population, resource use, and waste production drop to levels that can be sustained over the long term by a damaged planetary ecosystem.

That bitter outcome might have been prevented if we had collectively taken decisive action before we went into overshoot. We didn't, and at this point the window of opportunity is firmly shut. Nearly all the proposals currently being floated to deal with the symptoms of our planetary overshoot assume, tacitly or otherwise, that this is not the case and that we still have as much time as we need. Such proposals are wasted breath, and if any of them are enacted—and some of them very likely will be enacted, once today's complacency gives way to tomorrow's stark panic—the resources poured into them will be wasted as well.

Thus I think it's time to pursue a different and more challenging project. We could have had a better future if we'd done the right things when there was still enough time to matter, but we didn't. That being the case, what kind of future can we expect to get?

There is a standard term in historical studies for that kind of future. That term is “dark age.”



That label actually dates from before the period most often assigned it these days. Marcus Terentius Varro, who was considered the most erudite Roman scholar of his time, divided up the history known to him into three ages: an age of history, for which there were written records; before that, an age of fable, from which oral traditions survived; and before that, a dark age, about which no one knew anything at all.<sup>4</sup> It's a simple division but a surprisingly useful one. Even in those dark ages where literacy survived as a living tradition, records tend to be extremely sparse and unhelpful, and when records pick up again, they tend to be thickly frosted with fable and legend for a good long while thereafter. In a dark age,

the thread of collective memory and cultural continuity snaps, the ends are lost, and a new thread must be spun from whatever raw materials happen to be on hand.

Dark ages of this kind are a recurrent phenomenon in human history, and the processes by which they come about have a remarkable degree of similarity even when the civilizations that precede them differ in every imaginable way. The historian Arnold Toynbee, whose massive twelve-volume work *A Study of History* remains the most comprehensive study of historical cycles ever penned, has explored this curious parallelism in detail.<sup>5</sup> On the way up, he noted, each civilization tends to diverge not merely from its neighbors but from all other civilizations throughout history. Its political and religious institutions, its arts and architecture, and all the other details of its daily life take on distinctive forms, so that as it nears maturity, even the briefest glance at one of its creations is often enough to identify its source.

Once the peak is past and the long road down begins, though, that pattern of divergence shifts into reverse, slowly at first, and then with increasing speed. A curious sort of homogenization takes place: distinctive features are lost, and common patterns emerge in their place. That doesn't happen all at once, and different cultural forms lose their distinctive outlines at different rates, but the further down the trajectory of decline and fall a civilization proceeds, the more it resembles every other civilization in decline. By the time that trajectory bottoms out, the resemblance is all but total; compare one post-collapse society to another—the societies of post-Roman Europe, let's say, with those of post-Mycenean Greece—and it can be hard to believe that dark age societies so similar could have emerged out of the wreckage of civilizations so different.

It's interesting to speculate about why this reversion to the mean should be so regular a theme in the twilight and aftermath of so many civilizations. Still, the recurring patterns of decline and fall have another implication—or, if you will, another application.

Modern industrial society, especially but not only here in North America, is showing all the usual symptoms of a civilization on its way toward history's compost bin. If, as the evidence suggests, we've started along the familiar track of decline and fall, it should be possible to map the standard features of the way down onto the details of our current situation, and come up with a fairly accurate sense of the shape of the future ahead of us.

Mind you, the part of history that can be guessed in advance is a matter of broad trends and overall patterns, not the sort of specific incidents that make up so much of history as it happens. Exactly how the pressures bearing down on late industrial America will work out in the day-by-day realities of politics, economics, and society will be determined by the usual interplay of individual choices and pure dumb luck. That said, the broad trends and overall patterns are worth tracking in their own right, and some things that look as though they ought to belong to the realm of the unpredictable—for example, the political and military dynamics of border regions, or the relations among the imperial society's political class, its increasingly disenfranchised lower classes, and the peoples outside its borders—follow predictable patterns in case after case in history, and show every sign of doing the same thing this time around too.

What I'm suggesting, in fact, is that in a very real sense, it's possible to map out the outlines of the history of North America over the next five centuries or so in advance. That's a sweeping claim, and I'm well aware that the immediate response of at least some of my readers will be to reject the possibility out of hand. I'd like to encourage those who have this reaction to try to keep an open mind.

This claim presupposes that the lessons of the past actually have some relevance to our future. That's a controversial proposal these days, but to my mind the controversy says more about the popular idiocies of our time than it does about the facts on the ground. People in today's America have taken to using thought-

stoppers such as “But it’s different this time!” to protect themselves from learning anything from history—a habit that no doubt does wonders for their peace of mind today, though it pretty much guarantees them a face-first collision with a brick wall of misery and failure not much further down time’s road.

Among the resources I plan on using to trace out the history of the next five centuries is the current state of the art in the environmental sciences, and that includes the very substantial body of evidence and research on anthropogenic climate change. I’m aware that some people consider that controversial, and, of course, some very rich corporate interests have invested a lot of money into convincing people that it’s controversial, but I’ve read extensively on all sides of the subject, and the arguments against taking anthropogenic climate change seriously strike me as specious. I don’t propose to debate the matter here either—there are plenty of forums for that. While I propose to leaven current model-based estimates on climate change and sea-level rise with the evidence from paleoclimatology, those who insist that there’s nothing at all the matter with treating the atmosphere as an aerial sewer for greenhouse gases are not going to be happy with everything I have to say.

I also propose to discuss industrial civilization’s decline and fall without trying to sugarcoat the harsher dimensions of that process, and that’s going to ruffle yet another set of feathers. Those who follow the news will doubtless already have noticed the desperate attempts to insist that it won’t be that bad, really it won’t, that are starting to show up these days whenever straight talk about the future slips through the fog of collective mythology that our society uses to blind itself to the consequences of its own actions. Those who dare to use words such as “decline” or “dark age” can count on being taken to task by critics who insist earnestly that such language is too negative, that of course we’re facing a shift to a different kind of society but it shouldn’t be described in such disempowering terms, and so on through the whole vocabulary of the obligatory optimism that’s so fashionable among the privileged these days.

That sort of talk may be comforting, but it's not useful. The fall of a civilization is not a pleasant prospect—and that's what we're talking about, of course: the decline and fall of industrial civilization, the long passage through a dark age, and the first stirrings of the successor societies that will build on our ruins. That's how the life cycle of a civilization ends, and it's the way that ours is ending right now.

What that means in practice is that most of the familiar assumptions people in the industrial world like to make about the future will be stood on their heads in the decades and centuries ahead. Most of the rhetoric being splashed about these days in support of this or that or the other Great Turning that will save us from the consequences of our own actions assumes, as a matter of course, that a majority of people in the United States—or, heaven help us, in the whole industrial world—can and will come together around some broadly accepted set of values and some agreed-upon plan of action to rescue industrial civilization from the rising spiral of crises that surrounds it. My readers may have noticed that things seem to be moving in the opposite direction, and history suggests that they're quite correct.

Among the standard phenomena of decline and fall, in fact, is the shattering of the collective consensus that gives a growing society the capacity to act together to accomplish much of anything at all. The schism between the political class and the rest of the population—you can certainly call these “the one percent” and “the ninety-nine percent” if you wish—is simply the most visible of the fissures that spread through every declining civilization, breaking it into a crazy quilt of dissident fragments pursuing competing ideals and agendas. That process has a predictable endpoint, too: as the increasingly grotesque misbehavior of the political class loses whatever respect and loyalty it once received from the rest of society and the masses abandon their trust in the political institutions of their society, charismatic leaders from outside the political class fill the vacuum, violence becomes the normal arbiter of power, and the

rule of law becomes a polite fiction when it isn't simply abandoned altogether.

The economic sphere of a society in decline undergoes a parallel fragmentation for different reasons. In ages of economic expansion, the labor of the working classes yields enough profit to cover the costs of a more or less complex superstructure, whether that superstructure consists of the pharaohs and priesthoods of ancient Egypt or the bureaucrats and investment bankers of late industrial America. As expansion gives way to contraction, the production of goods and services no longer yields the profit it once did, but the members of the political class, whose power and wealth depend on the superstructure, are predictably unwilling to lose their privileged status, and they have the power to keep themselves fed at everyone else's expense. The reliable result is a squeeze on productive economic activity that drives a declining civilization into one convulsive financial crisis after another and ends by shredding its capacity to produce even the most necessary goods and services.

In response, people begin dropping out of the economic mainstream altogether, because scrabbling for subsistence on the economic fringes is less futile than trying to get by in a system increasingly rigged against them. Rising taxes, declining government services, and systematic privatization of public goods by the rich compete to alienate more and more people from the established order, and the debasement of the money system in an attempt to make up for faltering tax revenues drives more and more economic activity into forms of exchange that don't involve money at all. As the monetary system fails, in turn, economies of scale become impossible to exploit; the economy fragments and simplifies until bare economic subsistence on local resources, occasionally supplemented by plunder, becomes the sole surviving form of economic activity.

Taken together, these patterns of political fragmentation and economic unraveling send the political class of a failing civilization on a feet-first journey through the exit doors of history. The only skills its members have, by and large, are those needed to manipulate

the complex political and economic levers of their society, and their power depends entirely on the active loyalty of their subordinates, all the way down the chain of command, and the passive obedience of the rest of society. The collapse of political institutions strips the political class of any claim to legitimacy; the breakdown of the economic system limits its ability to buy the loyalty of those whom it can no longer inspire; the breakdown of the levers of control strips its members of the only actual power they've got; and that's when they find themselves having to compete for followers with the charismatic leaders rising just then from the lower echelons of society. The endgame, far more often than not, comes when the political class tries to hire the rising leaders of the disenfranchised as a source of muscle to control the rest of the populace and finds out the hard way that it's the people who carry the weapons, not the ones who think they're giving the orders, who actually exercise power.

The implosion of the political class has implications that go well beyond a simple change in personnel at the upper levels of society. The political and social fragmentation mentioned earlier applies just as forcefully to the less tangible dimensions of human life—its ideas and ideals, its beliefs and values and cultural practices. As a civilization tips over into decline, its educational and cultural institutions, its arts, literature, sciences, philosophies, and religions all become identified with its political class; this isn't an accident, as the political class generally goes out of its way to exploit all these things for the sake of its own faltering authority and influence. To those outside the political class, in turn, the high culture of the civilization becomes alien and hateful, and when the political class goes down, the cultural resources that it harnessed to its service go down with it.

Sometimes some of those resources get salvaged by subcultures for their own purposes, as Christian monks and nuns salvaged portions of classical Greek and Roman philosophy and science for the greater glory of God. That's not guaranteed, though, and even

when it does happen, the salvage crew picks and chooses for its own reasons—the survival of classical Greek astronomy in the early medieval West, for example, happened simply because the Church needed to know how to calculate the date of Easter. Where no such motive exists, losses can be total: of the immense corpus of Roman music, the only thing that survives is a fragment of one tune that takes about twenty-five seconds to play, and there are historical examples in which even the simple trick of literacy got lost during the implosion of a civilization and had to be imported centuries later from somewhere else.

All these transformations impact the human ecology of a falling civilization—that is, the basic relationships with the natural world on which every human society depends for day-to-day survival. Most civilizations know perfectly well what has to be done to keep topsoil in place, irrigation water flowing, harvests coming in, and all the other details of human interaction with the environment on a stable footing. The problem is always how to meet the required costs as economic growth ends, contraction sets in, and the ability of central governments to enforce their edicts begins to unravel. The habit of feeding the superstructure at the expense of everything else impacts the environment just as forcefully as it does the working classes: just as wages drop to starvation levels and keep falling, funding for necessary investments in infrastructure, fallow periods needed for crop rotation, and the other inputs that keep an agricultural system going in a sustainable manner all get cut.

As a result, topsoil washes away, agricultural hinterlands degrade into deserts or swamps, vital infrastructure collapses from malign neglect, and the ability of the land to support human life starts on the cascading descent that characterizes the end stage of decline—and so, in turn, does population, because human numbers in the last analysis are a dependent variable, not an independent one. Populations don't grow or shrink because people just up and decide one day to have more or fewer babies; they're constrained by ecological limits. In an expanding civilization, as its wealth and resource

base increases, the population expands as well, since people can afford to have more children, and since more of the children born each year have access to the nutrition and basic health care that let them survive to breeding age themselves. When growth gives way to decline, population typically keeps rising for another generation or so due to sheer demographic momentum, and then begins to fall.

The consequences can be traced in the history of every collapsing civilization. As the rural economy implodes due to agricultural failure on top of the more general economic decline, a growing fraction of the population concentrates in urban slum districts, and as public health measures collapse, these turn into incubators for infectious disease. Epidemics are thus a common feature in the history of declining civilizations, and of course, war and famine are also significant factors; but an even larger toll is taken by the constant upward pressure exerted on death rates by poverty, malnutrition, crowding, and stress. As deaths outnumber births, population goes into a decline that can easily continue for centuries. It's far from uncommon for the population of an area in the wake of a civilization to equal less than ten percent of the figure it reached at the precollapse peak.

Factor these patterns together, follow them out over the usual one to three centuries of spiraling decline, and you have the standard picture of a dark age society: a mostly deserted countryside of small and scattered villages where subsistence farmers, illiterate and impoverished, struggle to coax fertility back into the depleted topsoil. Their governments consist of the personal rule of local warlords, who take a share of each year's harvest in exchange for protection from raiders and rough justice administered in the shade of any convenient tree. Their literature consists of poems, lovingly memorized and chanted to the sound of a simple stringed instrument, recalling the great deeds of the charismatic leaders of a vanished age, and these same poems also contain everything they know about their history. Their health care consists of herbs, a little

rough surgery, and incantations cannily used to exploit the placebo effect. Their science—well, I'll let you imagine that for yourself.

And the legacy of the past? Here's some of what an anonymous poet in one dark age had to say about the previous civilization:

*Bright were the halls then, many the bath-houses,  
High the gables, loud the joyful clamor,  
Many the meadhalls full of delights  
Until mighty Fate overthrew it all.  
Wide was the slaughter, the plague-time came,  
Death took away all those brave men.  
Broken their ramparts, fallen their halls,  
The city decayed; those who built it  
Fell to the earth. Thus these courts crumble,  
And roof-tiles fall from this arch of stone.*

Fans of Anglo-Saxon poetry will recognize that as a passage from "The Ruin."<sup>6</sup> If the processes of history follow their normal pattern, they will be chanting poems like this about the ruins of our cities four or five centuries from now. How we'll get there, and what is likely to happen en route, will be the subject of this book.